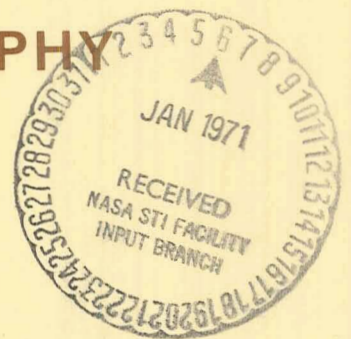




CASE FILE  
COPY

# AEROSPACE MEDICINE AND BIOLOGY

A CONTINUING BIBLIOGRAPHY  
WITH INDEXES



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

This bibliography was prepared by the NASA Scientific and Technical Information Facility  
operated for the National Aeronautics and Space Administration by Informatics Tisco, Inc.

**NASA SP-7011 (82)**

# **AEROSPACE MEDICINE AND BIOLOGY**

**A CONTINUING BIBLIOGRAPHY  
WITH INDEXES**

**A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA Scientific and Technical Information System during October, 1970.**



*Scientific and Technical Information Division*

**NATIONAL AERONAUTICS AND SPACE ADMINISTRATION**

**WASHINGTON, D.C.**

**NOVEMBER 1970**

This document is available from the National Technical Information Service (NTIS), Springfield, Virginia 22151 for \$3.00.



# INTRODUCTION

*Aerospace Medicine and Biology* is a continuing bibliography which, by means of periodic supplements, serves as a current abstracting and announcement medium for references on this subject. The publication is compiled through the cooperative efforts of the American Institute of Aeronautics and Astronautics (AIAA) and NASA Scientific and Technical Information Facility. It assembles, within the covers of a single bibliographic announcement, groups of references that were formerly announced in separate journals, and provides a convenient compilation for medical and biological scientists. Additional background details for this publication can be found in the first issue, NASA SP-7011, which was published in July, 1964. Supplements are identified by the same number followed by two additional digits in parentheses.

In its subject coverage, *Aerospace Medicine and Biology* concentrates on the biological, physiological, psychological, and environmental effects to which man is subjected during and following simulated or actual flight in the earth's atmosphere or in interplanetary space. References describing similar effects on biological organisms of lower order are also included. Such related topics as sanitary problems, pharmacology, toxicology, safety and survival, life support systems, exobiology, and personnel factors receive appropriate attention. In general, emphasis will be placed on applied research, but references to fundamental studies and theoretical principles related to experimental development also qualify for inclusion.

Each entry consists of a standard citation accompanied by its abstract in the following order:

- a. NASA entries identified by their *STAR* accession numbers (N 70-10000 series), and
- b. AIAA entries identified by their *IAA* accession numbers (A 70-10000 series).

The abstracts have been reproduced from those appearing in *STAR* and *IAA*. This procedure, adopted in the interests of economy and speed, has introduced some variation in size, style, and intensity of type.

# AVAILABILITY OF DOCUMENTS

## Availability of this Bibliography

Copies of *Aerospace Medicine and Biology* (NASA SP-7011) and its supplements are available to the public from the National Technical Information Service, Springfield, Virginia 22151, for \$3 each. Copies are available on initial distribution without charge to the following:

1. NASA Offices, Centers, contractors, subcontractors, grantees, and consultants;
2. Other U.S. Government agencies and their contractors;
3. Libraries in the United States that have arrangements with NASA to maintain collections of NASA documents for public use;
4. Other organizations in the United States having a need for NASA documents in work related to the aerospace program; and
5. Foreign government or academic organizations that have established appropriate reciprocal arrangements with NASA.

## STAR Entries

### Availability of NASA Documents

NASA documents are identified by an asterisk following the accession number. NASA documents that have been microfiched<sup>(1)</sup> (identified by the # sign) are available on microfiche without charge to an organization eligible to receive *Aerospace Medicine and Biology* without charge.

### Availability of Non-NASA Documents

Non-NASA documents are those documents that do not carry an asterisk in the citation. Department of Defense documents (identified by the "AD" number in the citation and indexes) are available, subject to a service charge, in hard copy or microfiche from the National Technical Information Service, Springfield, Virginia 22151. Microfiche copy of DOD reports are available to Defense Documentation Center users at no cost from the Defense Documentation Center, Cameron Station, Alexandria, Virginia 22314. National Lending Library (NLL) for Science and Technology translations are available from NLL at the price stipulated in the citation. Requests for purchase should be addressed to:

National Lending Library for Science and Technology  
Boston Spa, Yorkshire, England.

Dissertations selected from Dissertation Abstracts are available in xerographic copy and on microfilm for sale from University Microfilms, Inc., Ann Arbor, Michigan, 48106. All requests should cite the author and Order Number as they appear in the citation. Note that the dissertations are provided on microfilm and not microfiche.

Other non-NASA documents are publicly available as indicated in the citation. Those documents which have been microfiched are available on microfiche without charge only to NASA Offices, Centers, contractors, subcontractors, and consultants.

### How to Obtain Microfiche

If you are registered with NASA and eligible to receive reports as described above, send the completed *Document Request* (Facility Form 492) to:

NASA Scientific and Technical Information Facility  
P.O. Box 33  
College Park, Maryland 20740

(1) A microfiche is a transparent sheet of film, 105 x 148 mm in size, capable of containing up to 72 pages of information reduced to micro images (not to exceed 20:1 reduction).

If you are not registered with NASA and wish to receive information concerning registration, request *Registration Form—Technical Publications* (Facility Form 713) from the NASA Scientific and Technical Information Facility at the address given above. Others may obtain microfiche copies by purchase from:

National Technical Information Service  
(NTIS)  
Springfield, Virginia 22151

#### **U.S. Government Sales Agencies**

Publications with a CFSTI availability statement in the citation are sold in hard copy and microfiche copy by:

National Technical Information Service  
(NTIS)  
Springfield, Virginia 22151

The following unit price has been established by NTIS: \$3.00 for hard copy, \$0.65 for microfiche.

Publications with a SOD availability statement in the citation are sold in hard copy by:  
Superintendent of Documents, U.S. Government Printing Office (SOD)  
Washington, D.C. 20402

NASA documents available from the SOD are also available from NTIS at the SOD price given in the citation.

NOTE: Documents announced without specific availability statement may be requested from the issuing activity.

Bibliographic information, e.g., report number, etc., rather than the NASA accession number (i.e., N70-12345), should be provided when requesting a document from other than NASA.

#### **IAA Entries**

All cited documents are available from the AIAA Technical Information Service as follows: Paper copies are available at \$3.00 per document up to a maximum of 20 pages. The charge for each additional page is \$0.25. Microfiche are available at the rate of \$0.50 per microfiche for documents identified by the symbol # following the accession number. A number of publications, because of their special characteristics, are available only for reference in the AIAA Technical Information Service Library. Minimum air-mail postage to foreign countries is \$1.00.

Please refer to the accession number, e.g., A70-13193, when requesting documents. Address all inquiries and requests to:

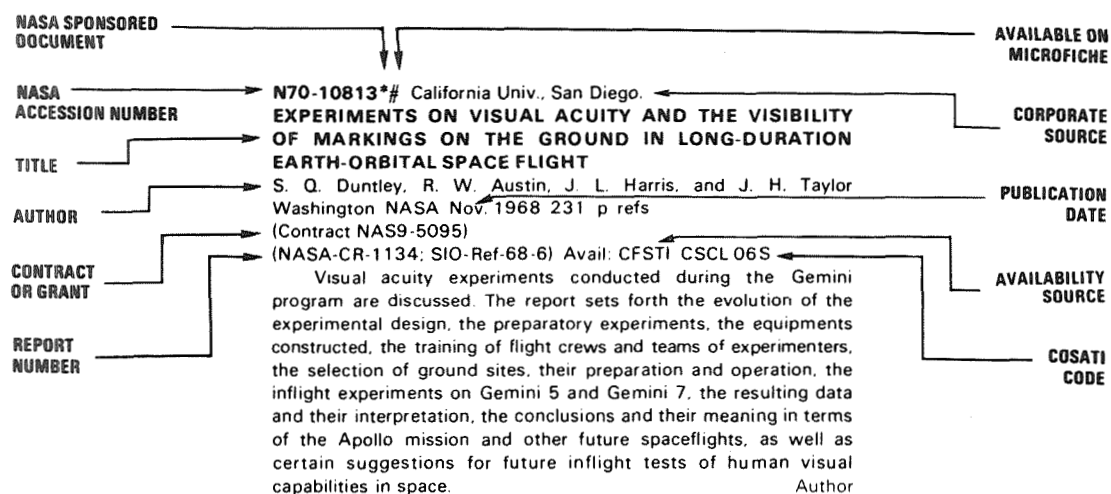
Technical Information Service  
American Institute of Aeronautics and Astronautics, Inc.  
750 Third Avenue, New York, N.Y. 10017

For further details please consult the *Introductions to STAR and IAA*, respectively.

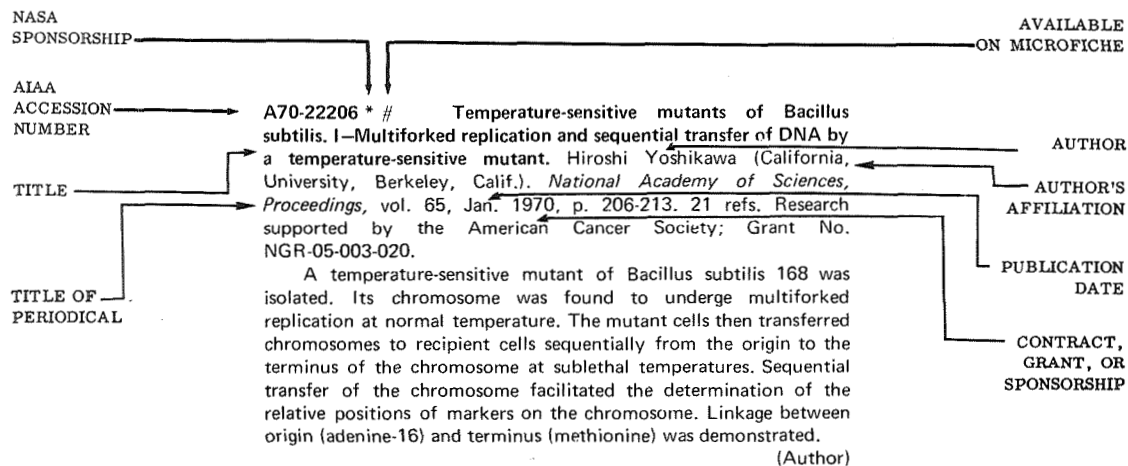
# TABLE OF CONTENTS

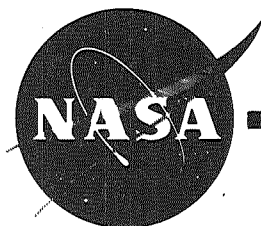
	Page
STAR Entries (N70-10000) . . . . .	1
IAA Entries (A70-10000) . . . . .	27
Subject Index . . . . .	I-1
Personal Author Index . . . . .	I-39
Corporate Source Index . . . . .	I-59

## TYPICAL CITATION AND ABSTRACT FROM STAR



## TYPICAL CITATION AND ABSTRACT FROM IAA





# AEROSPACE MEDICINE AND BIOLOGY

*a continuing bibliography*

NOVEMBER 1970

## STAR ENTRIES

**N70-34841#** System Development Corp., Santa Monica, Calif.  
**PLANNING BY MAN-MACHINE SYNERGISM: A CHARACTERIZATION OF PROCESSES AND ENVIRONMENT**  
Aiko M. Hormann 31 Mar. 1970 92 p refs  
(Contracts DAHC15-67-C-0149; Nonr-4745(00))  
(AD-704810; SDC-SP-3484/000/00) Avail: CFSTI CSCL 5/8

The paper describes an attempt to couple the complementary capabilities of man and machine in the context of planning and creative problem solving. Some real-world problems to which man-machine techniques can be fruitfully applied are characterized, and the types of decision dynamics influenced by these characteristics are identified. Then, how man tends to handle complexity and uncertainty is discussed in terms of the concept of cognitive economy. Next, characteristics of planning processes are discussed in terms of the hierarchical, iterative nature of planning and the stages of problem solving (goal setting, alternative generation, consequence estimation, and evaluation and alternative selection). Structural attributes extracted from such characterization constitute the basic framework and guiding mechanism for interaction in Gaku, a system of computer programs designed as a step toward man-machine synergism. Features of Gaku are then described in terms of both built-in capabilities that are relatively problem independent and man-machine actions for dynamic extension of these capabilities that are problem dependent and user oriented. The latter can be seen to make the system increasingly useful and powerful as a co-evolving man-machine team. Author (TAB)

**N70-34857\*** National Aeronautics and Space Administration.  
Manned Spacecraft Center, Houston, Tex.

### **LIFE RAFT Patent**

Glenn A. Shewmake and Matthew I. Radnofsky, inventors (to NASA) Issued 10 Nov. 1964 (Filed 5 Sep. 1962) 7 p Cl. 9-11  
(NASA-Case-XMS-00863; US-Patent-3,155,992;  
US-Patent-Appl-SN-221634) Avail: US Patent Office CSCL 06G

The design of an inflatable life raft for aircraft and boats is described. This survival equipment is constructed from lightweight fabric and is provided with fabric ballast buckets to insure the necessary stability. Boarding handles included provide additional aid in boarding from water. A radar reflective covering is stored in reefed condition on the raft; it can be unreefed and drawn up

about an occupant for shielding against sun and water spray. The configuration of this life raft tends to create a partial vacuum underneath so that the raft is somewhat uplifted from the water and thereby contributes to its stability. The whole device is reducable to a small package when deflated. G.G.

**N70-34944#** Human Resources Research Organization,  
Alexandria, Va.

### **COMBAT AVIATOR CRITERION DEVELOPMENT**

Wiley R. Boyles, Peter R. Prunkl, and James L. Wahlberg Nov. 1969 15 p refs Presented at the Am. Psychological Assoc. Conv., Washington, D.C., Sep. 1969  
(Contract DAHC19-70-C-0012)  
(AD-703510; HUMRRO-PP-34-69) Avail: CFSTI CSCL 5/9

Factors that must be considered in the development of criteria for proficient performance of a complex job are discussed in the context of the Army aviation combat situation. Ratings of aviators by peers, subordinates, and superiors on pertinent job behaviors have been collected following identification of the pertinent behaviors by the critical incident method. Author (TAB)

**N70-34976#** Naval Postgraduate School, Monterey, Calif.  
**AN INVESTIGATION OF PHYSIOLOGICAL CORRELATES OF VIGILANCE PERFORMANCE**

James Hager Tinsley (M.S. Thesis) Oct. 1969 39 p refs  
(AD-706054) Avail: CFSTI CSCL 5/10

The document is concerned with a theory that man typically cannot perform a vigilance task over extended periods of time without experiencing a decrement in performance, often as rapidly as fifteen minutes after commencing the task. This research was directed toward determining if some of man's physiological functions are correlated with his performance in a vigilance task. TAB

**N70-34986#** Joint Publications Research Center, Washington, D.C.

### **SPACE BIOLOGY AND MEDICINE, VOLUME 4, NO. 2, 1970**

1 Jul. 1970 146 p refs Transl. into ENGLISH of the publ. 'Kosmicheskaya Biologiya i Meditsina' Moscow, Med. Publishing House, 1970 p 1-90  
(JPRS-50862) Avail: CFSTI

The articles presented pertain to the effects of actual and simulated space flight stress on animals, human subjects, and cosmonauts. For individual titles, see N70-34987 through N70-35005.

N70-34989# Joint Publications Research Service, Washington, D.C.

**HABITUATION AND VESTIBULAR ADAPTATION**

B. B. Bokhov et al *In its Space Biol. and Med.*, Vol. 4, No. 2, 1970 1 Jul. 1970 p 16-25 refs (See N70-34986 19-04)

Avail: CFSTI

A state-of-the-art review is presented of investigations on habituation processes and vestibular adaptation using animals and humans. E.C.

N70-34990# Joint Publications Research Service, Washington, D.C.

**USE OF RADIOPROTECTIVE DRUGS DURING IRRADIATION SIMULATING RADIATION DAMAGE DURING PROLONGED SPACEFLIGHT**

V. D. Rogozkin et al *In its Space Biol. and Med.*, Vol. 4, No. 2, 1970 1 Jul. 1970 p 26-31 refs (See N70-34986 19-04)

Avail: CFSTI

The results are given of a year-long observation of dogs exposed to chronic irradiation (75 rem per year) and repeated acute irradiations (50 rem per year). The dogs were administered ATP and the complex drug amytravit to prevent possible disturbances of various organs and systems. The drugs appeared to exert a normalizing effect on the hemopoietic function. Author

N70-34992# Joint Publications Research Service, Washington, D.C.

**EFFECT OF AMBIENT TEMPERATURE ON BODY TOLERANCE TO INCREASING HYPOXIA AND HYPERCAPNIA IN NITROGEN-OXYGEN AND HELIUM-OXYGEN GAS MIXTURES**

P. A. Gulyayev et al *In its Space Biol. and Med.*, Vol. 4, No. 2, 1970 1 Jul. 1970 p 39-43 refs (See N70-34986 19-04)

Avail: CFSTI

The effect of different ambient temperatures on the tolerance of white mice and rats to increasing hypoxia, asphyxia, and hypercapnia in nitrogen-oxygen and helium-oxygen atmospheres was investigated. It is shown that the temperature decrease induced better tolerance to hypoxia in both atmospheres. At 0 to 40 C, the animals displayed higher tolerance to hypoxia in a helium-oxygen mixture than in a nitrogen-oxygen mixture. The highest animal tolerance to increasing asphyxia and hypercapnia alone was observed in both atmospheres at 20 C. In the temperature range 15 to 40 C the animals were more tolerant to increasing asphyxia in a helium-oxygen atmosphere and at lower and higher temperatures in a nitrogen-oxygen atmosphere. In this temperature range, the animals exhibited better tolerance to increasing hypercapnia in a helium-oxygen than in a nitrogen-oxygen mixture in space cabins has other advantages and that temperature conditions can be employed to increase tolerance to rising hypoxia and hypercapnia in enclosed environments. Author

N70-34993# Joint Publications Research Service, Washington, D.C.

**DEPENDENCE OF THE APPEARANCE OF RHYTHMIC VOLLEY ACTIVITY OF RESPIRATORY NEURONS IN THE MEDULLA OBLONGATA ON CARBON DIOXIDE PRESSURE IN ARTERIAL BLOOD**

A. M. Kulik et al *In its Space Biol. and Med.*, Vol. 4, No. 2, 1970 1 Jul. 1970 p 44-51 refs (See N70-34986 19-04)

Avail: CFSTI

Using microelectrode and stereotaxic techniques, the impulse activity of inspiratory and expiratory neurons of the medulla

oblongata of narcotized cats was investigated during acute hypocapnia (after artificial pulmonary ventilation) and hypercapnia (resulting from impaired CO<sub>2</sub> diffusion into the lungs after Diamox injection). A reduction in arterial CO<sub>2</sub> pressure to 15 mm Hg disturbed the volley impulse activity of respiratory neurons, occasionally suppressing generation of nerve impulses. An increase in arterial CO<sub>2</sub> pressure in response to Diamox produced different changes: it inhibited the impulse activity of respiratory neurons and diaphragmal muscles, sharply enhancing the electric activity of intercostal inspiratory muscles. Diamox injection prevented the development of hypercapnia regardless of the time and rate of the artificial pulmonary ventilation. Author

N70-34994# Joint Publications Research Service, Washington, D.C.

**STUDY OF THE DYNAMICS OF CHLORELLA POPULATION PRODUCTIVITY DURING STEADY AND TRANSIENT REACTOR OPERATION**

V. I. Savkin et al *In its Space Biol. and Med.*, Vol. 4, No. 2, 1970 1 Jul. 1970 p 52-60 refs (See N70-34986 19-04)

Avail: CFSTI

Autofluctuations in the efficiency of a Chlorella cultivator under steady operating conditions and with step-by-step illumination changes were analyzed. The temporal variations in cultivator efficiency under constant cultivation conditions were random. Numerical characteristics of the autocorrelation function of cultivator efficiency were derived statistically. In addition to random variations, periodic efficiency fluctuations were occasionally observed. The rate of CO<sub>2</sub> absorption by the culture varied during transient operation, which was about 2 to 2.5 hours. No periodic variations in reactor efficiency were noted during regular changes in illumination. Author

N70-34995# Joint Publications Research Service, Washington, D.C.

**STUDY OF THE FRACTIONAL COMPOSITION OF SKELETAL MUSCLE PROTEINS DURING HYPOKINESIA**

N. P. Mikaleva et al *In its Space Biol. and Med.*, Vol. 4, No. 2, 1970 1 Jul. 1970 p 61-68 refs (See N70-34986 19-04)

Avail: CFSTI

Changes were detected in the fractional composition of skeletal muscle proteins in white rats exposed to hypokinesia for 15, 22, and 30 days. During the three experimental series, the content of actomyosin proteins decreased significantly whereas the content of the T fraction and stroma proteins increased. Muscles of the control and experimental animals differed insignificantly with respect to total nitrogen concentration. The weight of the experimental animals decreased reliably by an average of 19%. The water content in the skeletal muscles remained unchanged during the 15- and 22-day experiments and increased by 1% during the 30-day experiment in comparison with the controls. The ATP concentration decreased significantly during the 15- and 22-day experiments but returned to the normal level by the 30th day. Author

N70-34996# Joint Publications Research Service, Washington, D.C.

**EFFECT OF ALDOSTERONE ON HEMODYNAMICS UNDER CONDITIONS OF RESTRICTED MOTOR ACTIVITY OF DOGS**

M. G. Kolpakov et al *In its Space Biol. and Med.*, Vol. 4, No. 2, 1970 1 Jul. 1970 p 69-76 refs (See N70-34986 19-04)

Avail: CFSTI

Experiments were made on 32 dogs of both sexes ages two to six years weighing from 12 to 25 kg. The control group

consisted of 22 dogs; 10 dogs were subjected to hypokinesia for two weeks, after which a course of aldosterone administration was initiated for six days. The dogs were placed in small cages. Hemodynamics was investigated under chloralose narcosis twice: two weeks after placement in the cages, after which aldosterone treatment was begun at once, and six days after, or three weeks after placement in the cages. A decrease in cardiac minute volume and stroke index and a marked decrease in the mean rate of blood expulsion from the left ventricle were observed. Blood circulation mass was reduced. There was evidence of a decrease in vascular tone, pulse wave propagation velocity, and systemic arterial pressure.

Author

**N70-34997#** Joint Publications Research Service, Washington, D.C.

**ACTIVATION OF RNA AND PROTEIN SYNTHESIS IN THE BRAIN AND INCREASE IN MEMORY RESISTANCE TO STRESS FACTORS UNDER THE INFLUENCE OF ADAPTATION TO HIGH-ALTITUDE HYPOXIA**

F. Z. Meyerson et al. *In its Space Biol. and Med.*, Vol. 4, No. 2, 1970 1 Jul. 1970 p 77-82 refs (See N70-34986 19-04)

Avail: CFSTI

Regular adaptation of rats to the intermittent effect of high-altitude hypoxia causes a pronounced activation of protein synthesis and an increase in the RNA concentration in the brain. This activation is accompanied by a better retention of the formed passive avoidance conditioned reflex and an increase in the resistance of response to exposure to an electric shock. Accordingly, adaptation to intermittent high-altitude hypoxia is a method which can activate protein and RNA synthesis in the brain, thereby increasing memory resistance to environmental stress factors.

Author

**N70-34998#** Joint Publications Research Service, Washington, D.C.

**EFFECT OF ACUTE HYPOXIA ON THE RATE OF ABSORPTION OF GLYCINE 1-C(14) AND ITS INCORPORATION INTO ORGANS AND TISSUES**

K. V. Smirnov et al. *In its Space Biol. and Med.*, Vol. 4, No. 2, 1970 1 Jul. 1970 p 83-92 refs (See N70-34986 19-04)

Avail: CFSTI

The effect of acute hypoxia on the absorption of glycine-1-C-14 introduced into the gastrointestinal tract of rats, distribution of the tagged glycine in the organs and tissues, and its elimination from the organism were investigated. An inhibitory effect of acute hypoxia on the evacuation function of the stomach was noted; the rate of glycine-1-C-14 absorption was reduced and incorporation into the tissues and organs decreased. During the first hour after exposure to acute hypoxia elimination of the glycine-1-C-14 with the urine was lower and in the feces was higher than in the control animals; later excretion with the urine was significantly higher and in the feces lower than in the controls.

Author

**N70-34999#** Joint Publications Research Service, Washington, D.C.

**SOME RESULTS OF MEDICAL INVESTIGATIONS MADE DURING FLIGHTS OF THE SOYUZ 6, SOYUZ 7, and SOYUZ 8 SPACESHIPS**

Ye. I. Vorobyev et al. *In its Space Biol. and Med.*, Vol. 4, No. 2, 1970 1 Jul. 1970 p 93-104 (See N70-34986 19-04)

Avail: CFSTI

Changes in physiological reactions of Soyuz 6, Soyuz 7, and Soyuz 8 crew members during their group flight are discussed. The cosmonauts remained in good health and their performance

remained unaffected. The pattern and degree of physiological changes were similar to those observed during earlier flights of comparable duration. It was found that various maneuvers exert no significant effect on crew performance but cause conspicuous changes in physiological parameters. Changes in physiological reactions, primarily of the cardiovascular and respiratory systems, in response to postflight submaximum physical loads are also described. Locomotor changes observed during the postflight examination are also discussed.

Author

**N70-35000#** Joint Publications Research Service, Washington, D.C.

**UNEXPECTED INFORMATION AS A PSYCHOLOGICAL FACTOR IN THE ACTIVITY OF AN ISOLATED OPERATOR**

O. N. Kuznetsov. *In its Space Biol. and Med.*, Vol. 4, No. 2, 1970 1 Jul. 1970 p 105-111 refs (See N70-34986 19-04)

Avail: CFSTI

The effect and degree of perception of unexpected and unusual information on assigned work (black and red tables were used) by test subjects exposed to long-term confinement and isolation in isolation chambers are analyzed. Types of disturbed activity and information perception are described. The more complete and precise the perception, the greater was its effect on the work. The best results were exhibited by strong-willed test subjects with good powers of concentration. The accumulated data are discussed from the point of view of preventing information loss and deterioration of work by crew members during spaceflight. Different motivation of the test subjects in relation to irregular stimuli may be associated with peculiarities of the orientation activity contributing to the development of illusions.

Author

**N70-35001#** Joint Publications Research Service, Washington, D.C.

**EFFECT OF REDUCED BAROMETRIC PRESSURE ON THE ELIMINATION OF GASEOUS AND VOLATILE METABOLITES BY MAN IN PRESSURIZED SUITS**

S. M. Gordinskiy et al. *In its Space Biol. and Med.*, Vol. 4, No. 2, 1970 1 Jul. 1970 p 112-118 refs (See N70-34986 19-04)

Avail: CFSTI

It was demonstrated experimentally that the average rate of elimination of amines, ammonia, phenol, acetone and hydrogen sulfide by a human subject in a pressurized suit increases with reduction of barometric pressure from 760 to 308 and 198 mm Hg, whereas the average rate of elimination of carbon monoxide and carbon dioxide, as well as hydrocarbons and oxidizable organic compounds, remains unchanged at altitudes of 10,000 m in comparison with sea level.

Author

**N70-35002#** Joint Publications Research Service, Washington, D.C.

**SOME INDICES OF MINERAL AND WATER METABOLISM IN HUMAN SUBJECTS AFTER EXPOSURE TO TRANSVERSE ACCELERATIONS**

G. I. Kozyrevskaya et al. *In its Space Biol. and Med.*, Vol. 4, No. 2, 1970 1 Jul. 1970 p 119-122 refs (See N70-34986 19-04)

Avail: CFSTI

Experiments were performed on 21 test subjects to determine typical changes in mineral and water metabolism resulting from their exposure to chest-to-back accelerations of 4 to 8 g and 4 to 14 g. The stress caused an increase in diuresis and excretion of potassium and chlorine; excretion of sodium changing insignificantly. The rate of diuresis and chlorine excretion returned to normal by the third day after the exposure, whereas the rate of potassium excretion remained increased for a longer period. A relationship between the acceleration and level of changes was established.

Author

## N70-35003

N70-35003# Joint Publications Research Service, Washington, D.C.

### POSSIBLE CHANGE IN THE PAIRED OPERATION OF THE VESTIBULAR APPARATUS DURING WEIGHTLESSNESS

B. B. Vegorov et al. *In its Space Biol. and Med.*, Vol. 4, No. 2, 1970 1 Jul. 1970 p 123-126 refs (See N70-34986 19-04)  
Avail: CFSTI

A study was made of the weight of the otoliths of the right and left sacculus, right and left utricle and right and left lagena in fish (pike). There was a considerable asymmetry in the weight of the otolithic membranes of these organs; it is assumed that this can be responsible for vestibular-autonomic disorders in cosmonauts during space flights. Author

N70-35004# Joint Publications Research Service, Washington, D.C.

### USE OF AN ULTRASONIC CARDIOGRAPH TRANSMITTER IN DYNAMIC BIORADIOTELEMETRY

A. N. Kozlov *In its Space Biol. and Med.*, Vol. 4, No. 2, 1970 1 Jul. 1970 p 127-132 refs (See N70-34986 19-04)  
Avail: CFSTI

An electrolyteless ultrasonic Doppler cardiography system is described which provides remote monitoring of cardiac functions for a man moving freely in small or intermediate size compartments. The cardiograph consists of a small ultrasonic unit which is placed directly on the subject, a signal analyzer, and recorder. The ultrasonic unit includes a pickup, generator, high frequency amplifier, and rectifier. A transistorized radio transmitter is used. E.C.

N70-35005# Joint Publications Research Service, Washington, D.C.

### MORPHOLOGICAL CHANGES IN BONE AND MUSCLE TISSUE DURING HYPOKINESIA

G. P. Bykov et al. *In its Space Biol. and Med.*, Vol. 4, No. 2, 1970 1 Jul. 1970 p 133-141 refs (See N70-34986 19-04)  
Avail: CFSTI

A study was made of the bone and muscle tissues of rats kept for different time intervals in small cages and rabbits with cast-immobilized limbs, as well as biopsies of muscles of human subjects afflicted with myasthenia. The investigated structures revealed changes with respect to the nature of hypodynamic conditions. Cast immobilization and myasthenia which rigidly block motor activity result in bone and muscle atrophy. Confinement of animals in small cages results in indistinct morphological changes indicating limited functional activity. Author

N70-35042\*# Exotech, Inc., Washington, D.C. Systems Research Div.

### PLANNING, EVALUATION, AND ANALYTICAL STUDIES IN PLANETARY QUARANTINE AND SPACECRAFT STERILIZATION Quarterly Progress Report

15 Jun. 1970 40 p  
(Contract NASw-2062)  
(NASA-CR-112501; QPR-1) Avail: CFSTI CSCL 06M

#### CONTENTS:

1. QUARANTINE, MICROBIOLOGICAL, AND HEAT STERILIZATION TECHNOLOGIES 22 p (See N70-35043 19-04)
2. ESTIMATION OF MICROBIAL RELEASE PROBABILITIES FROM A MARTIAN LANDER S. Schalkowsky and P. S. Levy 16 p (See N70-35044 19-04)

N70-35043\*# Exotech, Inc., Washington, D.C. Systems Research Div.

### [QUARANTINE, MICROBIOLOGICAL, AND HEAT STERILIZATION TECHNOLOGIES]

*In its Planning, Evaluation, and Anal. Studies in Planetary Quarantine and Spacecraft Sterilization* 15 Jun. 1970 22 p (See N70-35042 19-04)

Avail: CFSTI CSCL 06M

The design of a rapid response information system for the quarantine document system for planetary flight missions was completed. Three tasks facilitated the effective transfer into flight programs of supporting technology developed by the NASA planetary quarantine office: (1) methods of bio-load estimation and prediction, (2) estimation of the probability of in-flight recontamination, (3) combined thermal radiation sterilization. Analysis of microbial release probabilities led to studies on the performance of a sensitivity analysis of parameters which define microbial release in the course of spacecraft impact and subsequent aeolian erosion. Analytical models of flight project implementation of planetary quarantine requirements were used in thermodynamic studies in heat sterilization guidelines and microorganism moisture diffusion model for applicability to buried and mated sources. To establish the feasibility and general characteristics of an information system on organic chemical contamination of the planets identification of, and contacts with, members of the Viking '75 Project Science Team ascertained requirements for the control and concentration of organic contamination. S.S.

N70-35044\*# Exotech, Inc., Washington, D.C. Systems Research Div.

### ESTIMATION OF MICROBIAL RELEASE PROBABILITIES FROM A MARTIAN LANDER

Samuel Schalkowsky and Paul S. Levy *In its Planning, Evaluation, and Anal. Studies in Planetary Quarantine and Spacecraft Sterilization* 15 Jun. 1970 16 p Presented at the COSPAR Panel on Planetary Quarantine, May 1970 (See N70-35042 19-04)

Avail: CFSTI CSCL 06E

A probability estimation is presented that terrestrial organisms contained in, or on, a Martian landing spacecraft will be released onto the surface of the planet in a viable state. The relevance of obtaining such an estimate resides in the fact that to the extent that a probability of less than unity can be assigned to the release event, to the same extent the heat sterilization and/or microbial control procedures can be relaxed. The overall planetary quarantine constraint, in the context of which this analysis must be made, is summarized. Author

N70-35090# Federal Aviation Administration, Oklahoma City, Okla.

### COMPLEX PERFORMANCE DURING EXPOSURE TO HIGH TEMPERATURES

P. F. Iampietro, W. Dean Chiles, E. A. Higgins, Harry L. Gibbons, and Alan E. Jennings Jun. 1969 19 p refs  
(AD-703632; FAA-AM-69-10) Avail: CFSTI CSCL 6/19

The effects of high temperature on psychomotor performance and physiological function were studied on male pilots (age 30-51) holding a current medical certificate. A total of 41 runs were made at neutral (23.8C (75F), or hot (60.0C (140F), 71.1C (160F)) temperatures with low humidities (less than 20 mm. Hg at 60.0 and 71.1C). Heart rate (ECG), deep body temperature (rectal probe) and skin temperature were recorded at 2-minute intervals. Performance on a complex performance device (two-dimensional tracking, mental arithmetic, and monitoring) was scored for 5-minute intervals which varied in task difficulty. During exposure to 71.1C mean rectal temperature reached 38.05C (100.5F), mean peak heart rate was 132 beats/min., and mean finger temperature peaked at 42C



(107.6F). There were significant decrements in performance (tracking and mental arithmetic) at 71.1C at 60.0C there were no performance decrements during 30 minutes of exposure. Results are discussed as they apply to aircrew in high performance aircraft.  
Author (TAB)

**N70-35091#** Federal Aviation Administration, Oklahoma City, Okla.

**METHODOLOGY IN THE ASSESSMENT OF COMPLEX PERFORMANCE. THE EFFECTS OF SIGNAL RATE ON MONITORING A STATIC PROCESS**

W. Dean Chiles and Cheryl B. Bruni Aug. 1969 12 p refs  
(AD-703635; FAA-AM-69-16) Avail: CFSTI CSCL 5/10

This study concerned the rate of presentation of stimuli on a task involving the monitoring of a static process of the kind represented by aircraft warning light indicators. The task was performed concurrently with various combinations of tasks requiring the exercise of psychological functions representative of the demands placed on the human operator in aviation operations. The signal rates used were: 10.3 signals/hour, 17 signals/hour, and 22.5 signals/hour. The only task for which performance varied significantly across the three rates of signal presentation was the task requiring the monitoring of a dynamic process; performance of this task was facilitated by the highest rate of signal presentation on the static monitoring task. The two faster rates of signal presentation were found to yield more reliable measures of static monitoring performance than the lower rate.  
Author (TAB)

**N70-35093#** Human Factors Research, Inc. Goleta, Calif.  
**CUTANEOUS SENSITIVITY: A REVIEW OF SOME LITERATURE, PROBLEMS AND APPROACHES**

Chester H. Baker and Robert J. Hall Dec. 1969 132 p refs  
(AD-704344; HEL-TM-21-69) Avail: CFSTI CSCL 6/16

The review embraces some of the research on cutaneous sensitivity which has been reported, for the most part, within the last 15 years. The major emphasis is upon reports of a fundamental nature. Several areas of research have been ignored completely; such as tactile communications and pain. Part 1 is a conventional review of reports, briefly outlining apparatus, procedures and findings. Part 2 is an attempt to show where data from different experiments appear to be, or not be, consistent, and it discusses the problems and difficulties that confront the scientist engaged in cutaneous research.  
Author (TAB)

**N70-35107#** Woods Hole Oceanographic Institution, Mass. Dept. of Biology.

**BENTHIC BIOMASS AND SURFACE PRODUCTIVITY**

Gilbert T. Rowe 1969 22 p refs Presented at the Intern. Symp. on the Fertility of the Sea, Sao Paulo, Brazil  
(Contract AT(30-1)-3862; Grants NSF GZ-259; NSF GA-1298)  
(NYO-3862-24; CONF-691206-2) Avail: CFSTI

Benthic samples from the north temperate Atlantic, the Gulf of Mexico, the Atlantic off Brazil, and the Pacific off Peru provided data for a comparison of animal densities and biomass under varying ecological conditions. The relationships between the logarithm (base 10) of biomass (or animal density) and depth can be described by statistically significant least squares linear regressions. The average biomass and the different rates of decrease in life with depth in different regions can be used to infer the magnitude of effects of surface production on the bottom fauna. The regression coefficients or rates of decrease in animal density were greatest where surface productivity varied markedly in an offshore direction. Where productivity varied to a lesser degree, the rates of decrease were reduced. These regressions suggest that while

depth exerts the most stringent effects, surface productivity ranks second in controlling benthic biomass.  
Author

**N70-35152\*** National Aeronautics and Space Administration, Manned Spacecraft Center, Houston, Tex.

**SHOCK ABSORBING SUPPORT AND RESTRAINT MEANS Patent**

Douglas J. Geier, Gerald J. Pesman, Richard S. Johnston, and Matthew I. Radnofsky, inventors (to NASA) Issued 12 Jan. 1965 (Filed 17 Dec. 1963) 9 p Cl. 297-216  
(NASA-Case-XMS-01240; US-Patent-3,165,356;  
US-Patent-Appl-SN-331324) Avail: US Patent Office CSCL 06Q

A shock absorbing couch is described for supporting individuals subjected to large acceleration or deceleration forces. The couch is made of a net or webbing which is attached to a rigid framework. The webbing is made from partially drawn synthetic strands which are normally nonelastic; when a load in excess of a predetermined amount is applied to the webbing the strands elongate and absorb energy without significant recoil or rebound.  
E.C.

**N70-35167\*#** Sandia Corp., Albuquerque, N. Mex. Planetary Quarantine Applied Science Div.

**A STUDY OF THE EFFECTIVENESS OF THERMORADIATION STERILIZATION**

Marcel C. Reynolds, Kermit F. Lindell, and Nancy Laible Jun. 1970 27 p refs Sponsored in part by AEC  
(NASA Order W-12853)  
(NASA-CR-109972; SC-RR-70-423) Avail: CFSTI CSCL 06M

Temperature required for thermal sterilization are known to degrade certain heat sensitive components, materials, and products. Simultaneous application of lower temperatures and low levels of gamma radiation produces a synergistic effect which can sterilize with fewer damaging side effects. A means of determining the optimum balance heat and gamma radiation is demonstrated.  
Author

**N70-35262#** Hokkaido Univ., Sapporo (Japan).

**INFLATION TEST OF LIFERAFT AT LOW TEMPERATURES**

Nubuo Ono and Tadashi Tabata *In its Low Temp. Sci., Ser. A* 1969 p 351-358 ref In JAPANESE; ENGLISH summary (See N70-35238 19-13)  
Avail: CFSTI

Inflating tests of liferafts were performed by the use of the usual CO<sub>2</sub> gas bottles and CO<sub>2</sub> + N<sub>2</sub> gas bottles at ambient temperatures of -10, -15, -20 and -30C. The raft used in these tests is shown. The gas pressure inside the buoyancy tube was measured as a gain over the atmospheric pressure at suitable time intervals during the process of inflation. It was found inflating by the usual CO<sub>2</sub> gas, the inner pressure reaches a satisfying pressure after an hour. The results of the tests on the effect of an addition of N<sub>2</sub> gas are summarized. The time required to inflate the raft shows a long delay with fall of the ambient temperature. The buoyancy tube shrinks with the falling temperature. It is fortunate that owing to the decrease in volume of the buoyancy tube, the inner-pressure does not suffer a large decrease with the falling of the temperature as was seen in the pressure depression theoretical consideration under a constant volume.  
S.S.

**N70-35311#** Telluron, Santa Monica, Calif.

**OPERANT-CONDITIONABLE MACHINES Annual Progress Report**

Charles E. Hendrix Mar. 1970 67 p refs  
(Contract N00014-69-C-0368)  
(AD-703758; APR-1) Avail: CFSTI CSCL 6/4

The term operant-conditionable machine refers to an adaptive controller in which adaptation proceeds by the application of generalized punishments or rewards. The machine is based on a network of neuromimes, electronic circuits which mimic the function of living neurons. Each neuromime can act upon others in either an excitatory or an inhibitory manner. Adaptation or training takes place by adjustment of thresholds of the individual neuromimes. The punishment or reward is connected to all neuromimes in the net, but only those which are currently active are able to accept the reinforcement signal. In this way, the subpopulation of neuromimes which responds to a given input can be induced to respond more or less strongly. In the latter case (punishment), the reduction in strength of response will reduce the inhibitory influence the subpopulation was exerting on the rest of the network. A new subpopulation will then respond; therefore, the net will have been induced to try a new response to the same input. A breadboard conditionable machine of limited size has been built and has been used to demonstrate a number of trainable functions. Any one of a number of inputs can be selectively connected to a single output by application of training signals. Any one of a number of outputs can be connected to a single input. Temporal waveforms can be generated and can be modified by application of reinforcements.

Author (TAB)

N70-35314# Army Medical Research Lab., Fort Knox, Ky.  
Experimental Psychology Div.

**FAST RETINAL POTENTIAL LUMINOSITY FUNCTIONS  
Progress Report**

Calvin K. Adams and William W. Dawson 3 Dec. 1969 16 p  
refs

(Contracts DADA17-67-C-7118; AT(40-1)-3599)  
(AD-703178; USAMRL-841) Avail: CFSTI CSCL 6/16

The adaptation dependence of high frequency signals (fast retinal potentials or FRPs) was analyzed from measures taken from the human cornea. Narrow band chromatic stimuli were presented to two normal Ss under photopic, mesopic, and scotopic adaptation conditions. Signals were recorded in two pass-bands, conventional broad-band (0.2 Hz - 2 kHz) and selective narrow band (50 Hz - 2 kHz).

Author (TAB)

**N70-35320+ Laboratorio de Acustica e Sonica, Sao Paulo (Brazil).  
SOUND LEVEL MEASUREMENTS PERCENT BAND AND  
OCTAVE BAND ANALYSIS OF THE NOISE AND VIBRATION  
IN INDUSTRIAL INSTALLATION [MEDIAS DE NIVEIS  
GLOBAIS, ANALISE EM FAIXA PERCENTUAL E EM FAIXAS  
DE OITAVAS DO BARULHO E VIBRACOES EM  
INSTALACAO INDUSTRIAL]**

L. F. Delbonne and J. R. da Costa 10 Oct. 1969 52 p refs  
In PORTUGUESE; ENGLISH summary  
(TR-6910.386) Avail: CFSTI

The equipment, accessories and procedures for sound level measurements, and analysis by percent band and octave band of the noise and vibration in industrial installation are described. The health hazard problem presented by the noise levels is discussed, and suggestions for a viable solution are presented. The results of the noise measurements are presented in tables and graphs. The legal aspects of hearing loss and protection are also discussed.

Author

N70-35340# President's Science Advisory Committee,  
Washington, D.C. Space Science and Technology Panel.  
**THE BIOMEDICAL FOUNDATIONS OF MANNED SPACE  
FLIGHT**

Nov. 1969 37 p  
(AD-703316) Avail: SOD \$0.45; CFSTI CSCL 6/19

In order to define an appropriate mix of manned and unmanned operations, NASA will need to qualify man for space flight in the broadest sense. That is, NASA should pursue a biomedical program which explores the optimization of man's role in space, the limitations on his effectiveness and means to circumvent those limitations, in short, a program to determine the best use of man as a space subsystem in interaction with automated subsystems. An effective program directed to this objective exceeds the present capabilities of NASA and involves resources not yet developed in the biomedical community. In this report, consideration is given to the implications of such a program and a number of recommendations are offered which are intended to accomplish this objective.

Author (TAB)

N70-35354# Federal Aviation Administration, Oklahoma City,  
Okla. Civil Aeromedical Inst.

**THE SPIRAL AFTEREFFECT. 2: INFLUENCES OF VISUAL  
ANGLE AND RETINAL SPEED ON THE DURATION AND  
INTENSITY OF ILLUSORY MOTION**

Mary Jane Williams and William E. Collins Aug. 1969 14 p  
refs

(AD-703634; FAA-AM-69-15) Avail: CFSTI CSCL 6/16

Visual illusions have been a persistent problem in aviation research. The spiral aftereffect (SAE) is an example of one type of visual illusion--that which occurs following the cessation of real motion. Duration and intensity of the SAE was evaluated under five conditions. Results indicate that perceived (rather than physical) characteristics of the stimulus situation may have the most significant effects on duration of the SAE. The findings thus have considerable pertinence to the evaluation of effective factors in the production of a variety of other visual illusions which can occur in aviation environments.

Author (TAB)

N70-35362# Air Force Systems Command, Wright-Patterson  
AFB, Ohio Foreign Technology Div.

**PRELIMINARY CONVERSION OF IMAGES IN A VISUAL  
IMAGE IDENTIFICATION SYSTEM**

N. L. Melikadze 13 Nov. 1969 15 p ref Transl. into ENGLISH  
from Akad. Nauk Gruzinskoi SSR, Tiflis (USSR), v. 50, no. 2, 1968  
p 309-314

(AD-703380; FTD-MT-24-253-69) Avail: CFSTI CSCL 6/4

Set S, whose elements are called objects, is considered. It is necessary to establish whether an object from S has a certain feature P. If we succeed in establishing an algorithm which makes it possible to give a positive answer as to whether the object has or has not the given feature P, then it is considered that feature P is formalized. However, it is not always possible to formalize feature P. In such cases feature P is called informal. In order to have a certain idea about this informal feature of an object from S, the concept of a trial charge (a certain device) is introduced. Because of the internal structure of this device its reaction to objects from S with or without feature P is different. On set S such a trial device is defined, utilizing a plane rectangular field composed of a finite number of cells painted in black or white. The class of functions is introduced. In the class of functions, a function was established which transforms in a best manner images from the field X into the smaller field X-1, retaining the definite informal features of the object. It is shown how this preliminary transformation of images can be utilized in the recognition of visual patterns.

Author (TAB)

N70-35366# Syracuse Univ., N.Y. Lab. of Sensory  
Communication.

**TEMPORAL SENSORY INTEGRATION Final Report, 1 Nov.**

1959-31 Jan. 1970

Jozef J. Zwislocki Feb. 1970 133 p refs

(Contract Nonr-699(13))

(AD-703376; LSC-S-6) Avail: CFSTI CSCL 6/16

Sensory systems, in particular those of vision and hearing, are known to mimic some of the characteristics of a linear, temporal energy integrator. Experiments conducted on the project have demonstrated that the sense of touch is endowed with the same property. Temporal sensory summation is of substantial practical importance. It intervenes in signal detection and speech perception, as well as in brightness, loudness and pressure sensations. It has direct bearing on the loudness scaling of environmental noise, in particular, of sonic booms. Research on the project was pursued in two directions: measurements of fundamental characteristics and a general theory of temporal sensory summation. The research has not been finished. Nevertheless, a large number of useful data were obtained and several broad generalizations were achieved. These results permit prediction of auditory and tactile thresholds for any arbitrary temporal stimulus pattern and form a basis for calculation of loudness of short tone or noise bursts.

Author (TAB)

N70-35375# Human Engineering Labs., Aberdeen Proving Ground, Md.

**REACTION TIME: A BIBLIOGRAPHY WITH ABSTRACTS**

Arthur S. Kamlet and Lawrence J. Boisvert Oct. 1969 173 p refs

(AD-703857) Avail: CFSTI CSCL 5/10

The bibliography is a compilation of 540 abstracted references dealing with reaction time in selected human information-processing tasks.

Author (TAB)

N70-35379# Bunker-Ramo Corp., Canoga Park, Calif.

**HUMAN PERFORMANCE PREDICTION IN MAN-MACHINE SYSTEMS. VOLUME 1: A TECHNICAL REVIEW**

Dorothy L. Finley, Richard W. Obermayer, C. M. Bertone, David Meister, and Frederick A. Muckler Washington NASA Aug. 1970 226 p

(Contract NAS2-5038)

(NASA-CR-1614) Avail: CFSTI CSCL 05H

Tests and test techniques for human performance prediction in man-machine system tasks are reviewed. The tests are related to human performance dimensions found in human operator tasks which are executed to obtain system performance criteria. A task taxonomy for man-machine systems is introduced and compared with two other methods. A hypothetical example is given for an earth orbiting scientific laboratory which evaluates human behavior during rendezvous and docking, extravehicular activity, and onboard scientific experiments.

R.B.

N70-35421# Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

**DISPERSION PATTERNS OF AEROSOL PARTICLES IN A FREE ATMOSPHERE**

G. M. Petrova et al 7 Nov. 1969 51 p refs Transl. into ENGLISH from Tr. Inst. Prikl. Geofiz. (USSR), no. 4, 1967 p 5-40 (AD-702332; FTD-MT-24-283-69) Avail: CFSTI CSCL 6/6

A comprehensive description and analysis are presented of experimental studies of the dispersal and fallout of solid particles (luminescent sand particles, 100-1000  $\mu$  in diameter, and luminescent plastic particles, 30-100  $\mu$  in diameter) dispersed at

heights of 500-8000 m in the free atmosphere and falling out at a rate of from 0.1 to 3 m/sec. The traces of the aerosol particle fallout were measured to determine the relationships between their principal characteristics (surface concentrations, positions of zones of maximum particle concentration, amount of surface concentration dispersion) and total amount of particles ejected, the wind speed, and rate of particle fallout. The information presented includes: description of experimental procedures (preparation of luminescent particles and location, description, period of operation and sizes of test sites; methods of aerological observation (pibal, aircraft); and identification and grouping of four types of atmospheric stratification. The field results are graphed, tabulated, and summarized in detail. Empirical relationships investigated related to analysis of the practical utilization of the equation for turbulent diffusion and the coefficient of turbulent mixing in the derivation of a simple empirical equation.

Author (TAB)

N70-35482# Defense Documentation Center, Alexandria, Va.  
**SMALL GROUP DYNAMICS, VOLUME 1 A DDC Bibliography, Aug. 1952-Mar. 1969**

Feb. 1970 494 p refs

(AD-703600; DDC-TAS-69-78-1) Avail: CFSTI CSCL 5/10

The bibliography contains annotated references to small groups of twenty subjects or less. The reports are on the adjustments, interpersonal relations, task effectiveness, and performance under various conditions. Decision making, attitudes and responses are some of the factors analyzed in the reports on group dynamics. The individual entries are arranged in AD number sequence. The computer-generated indexes are Corporate Author/Monitoring Agency and Personal Author.

Author (TAB)

N70-35504# New York Univ., N.Y. Dept. of Industrial Engineering and Operations Research.

**EVOKED POTENTIALS AND VISUAL INFORMATION PROCESSING Annual Summary Report, 1 Apr. 1969-31 Mar. 1970**

John L. Andreassi and Mark S. Mayzner 31 Mar. 1970 70 p refs

(Contract N00014-67-A-0467-0009)

(AD-703330; NYU-O-5511-356; ASR-1) Avail: CFSTI CSCL 6/4

The report outlines the rationale underlying our present research program which is concerned with the study of averaged sensory-evoked potentials during visual information processing. In addition, our general methodology, laboratory facilities, computer software developments and the results of three experiments are discussed in detail.

Author (TAB)

N70-35518# Congress. Senate. Committee on Public Works.  
**AIR POLLUTION, 1969**

Washington GPO 1970 248 p refs Hearings on Probl. and Programs Assoc. with the Control of Air Pollution before Comm. on Publ. Works, 91st Congr., 1st Sess., St. Louis, 1969  
Avail: Subcomm. on Air and Water Pollution

The hearings are reported on the air pollution problems for the St. Louis area which were conducted to obtain information for enacting legislation to assure maximum health protection and the establishment of standards. Data prepared by the National Air Pollution Control Administration for the high pollution in the St. Louis metropolitan area from 25 to 28 August 1969 are included. Subjects discussed include: national industrial emission standards, development of low emission automobiles, development of

N70-35577

mass transit systems, pollution standards for government contracts, ecology, and respiratory hazards including emphysema. A proposed air pollution alert plan, and the Missouri Air Conservation Law are also included.

F.O.S.

N70-35577 Centraal Instituut Voor Voedingsonderzoek TNO Zeist (Netherlands).

**THE EFFECTS OF HOT STERILIZATION AND FIVE YEAR STORAGE ON THE NUTRITIONAL VALUES OF CANNED FOODS [DE INVLOED VAN HET STERILISEREN EN VAN 5 JAAR BEWAREN OP DE VOEDINGSWAARDE VAN MAALTIJDEN IN BLIK]**

E. W. Hellendoorn, A. P. de Groot, L.P. van der Mijl Dekker, and P. Slump Jan. 1970 15 p Mostly in DUTCH, partly in ENGLISH (R-3092) Avail: CFSTI

Effects of sterilization and five year room storage at normal temperatures were studied on various canned meals. White canned beans in tomato sauce exhibited the highest iron values of all studied foods; however, this content was well below health damage standards. Vitamin contents in canned meals 5 years after sterilization remained almost constant with the exception of vitamin A, which was completely eliminated after about 1.5 years. Sterilization and storage time decreased also gradually protein values, depending on the content of methionine and cystine. Basic protein values for dry peeled fruit conserves were generally lower than those for other meals. Addition of methionine prolonged markedly the nutritional value of canned dun peas with bacon.

Transl. by G.G.

N70-35619\*# National Aeronautics and Space Administration, Langley Research Center, Langley Station, Va.

**THE LIQUID WASTE FEED SYSTEM Patent Application**

John B. Hall, Jr., Yi Tung, and LaVern W. Winn, inventors (to NASA) 15 Jan. 1970 14 p

(NASA-Case-LAR-10365-1; US-Patent-Appl-SN-3151) Avail: CFSTI CSCL 13B

A pressurized liquid waste tank which feeds liquid waste into liquid waste processing equipment is described. The processed liquid is pumped into an accumulator tank which has an actuator that opens and closes microswitches as the accumulator tank is filled and emptied. These microswitches control solenoid valves which are located in the lines feeding the liquid waste processing equipment, the accumulator tank and the collecting tank. An electrical circuit ties together the switches and valves in a manner such that sufficient waste liquid is automatically maintained in the liquid waste processing equipment to give optimum system performance in a zero gravity environment.

NASA

N70-35632# Congress. Senate. Committee on Public Works.  
**AIR POLLUTION, 1968, PART 3**

Washington GPO 1968 339 p refs Hearings on Air Quality Criteria before Comm. on Public Works, 90th Congr., 2d Sess., Oct. - Nov. 1968

Avail: Subcomm. on Air and Water Pollution

The results of hearings on air quality criteria are reported, emphasizing experience with general health and safety practices and their application to the development of such criteria. Established legislation provides for the issuance and revision of air quality criteria for individual contaminants, groups of contaminants, or combinations of contaminants on the basis of available medical and scientific evidence with respect to the health and welfare effects of air pollution.

R.B.

N70-35636# Mississippi Univ., University. Dept. of Psychology.  
**CONTROL SYSTEMS WITH ANIMAL COMPONENTS Final Report**

William F. Crowder 6 Feb. 1970 6 p refs

(Grant AF-AFOSR-1445-68)

(AD-703085; AFOSR-70-0713TR) Avail: CFSTI CSCL 6/2

This project constituted the initial phase of what was to be a long-term program of basic research dealing with future military and industrial automatic control systems having small animals as components. The immediate objectives were the locating and assembling of the literature containing the available background information needed for the long-term research program, and those portions of the planning of the long-term program that must be completed well before the program starts. An additional objective was approved after the project began, namely, that of starting to conduct some of the laboratory research comprising the long-term program.

Author (TAB)

N70-35661\*# National Aeronautics and Space Administration, Manned Spacecraft Center, Houston, Tex.

**THE DEVELOPMENT OF LOW ELASTIC WEBBINGS FOR USE IN THE FABRICATION OF RESTRAINT HARNESSES**

Douglas Geier and E. F. Perkins 2 Jun. 1966 17 p /ts Program Apollo Working Paper No. 1207

(NASA-TM-X-64437) Avail: CFSTI CSCL 13L

A development program was conducted to advance the state-of-the-art in restraint harness webbing which would provide more optimum harnesses in the Apollo command module, lunar excursion module, and future space vehicles. The result of this program was the development of a nylon-linen webbing material which has a nominal 5 percent elongation characteristic and breaking strength equal to or greater than existing webbings of comparable size.

Author

N70-35696\*# National Aeronautics and Space Administration, Manned Spacecraft Center, Houston, Tex.

**INVESTIGATION OF THE VISUAL REFERENCE REQUIREMENTS FOR PILOT CONTROL OF GLIDING PARACHUTES FOR LAND LANDING OF SPACECRAFT**

James E. Burkett 20 Apr. 1965 30 p /ts General Working Paper No. 10044

(NASA-TM-X-64430) Avail: CFSTI CSCL 05H

A test program was completed which investigated the problems associated with pilot control of a gliding-controllable parachute for landing a spacecraft on land. Wind drift determination, visual selection of a landing area, and obstacle avoidance were the major problems investigated. Methods of testing included helicopter simulation of the parasail parameters and scale model air drops of an actual parasail. The scale model testing included movie camera investigation for preliminary pilot visual requirements determination and later a television system for pilot control investigations. A variety of test subjects were used to get different opinions on the system tested and the landing techniques used. It was found that with a system which gave the controller a view of a large percentage of the landing zone attainable and a simple reticle, landings could be successfully accomplished with visual control up to altitudes of 10,000 feet, providing the selected landing zone had a sufficient number of clear landing areas and that wind and visibility conditions were within acceptable limits.

Author

N70-35724\*# National Aeronautics and Space Administration, Manned Spacecraft Center, Houston, Tex.

**DEVELOPMENT AND QUALIFICATION OF THE APOLLO SEA DYE MARKER**

R. W. Bricker, J. J. Liddell, and W. L. Vogt 8 May 1967 19 p  
*Its Program Apollo Working Paper No. 1318*  
 (NASA-TM-X-65045) Avail: CFSTI CSCL 06G

In-house development was undertaken to provide a 12-hour life sea dye marker as equipment for Apollo spacecraft by utilizing a canister with fluorescein dye powder dispensed through small orifices. Twelve-hour dye life has been verified in Gulf of Mexico tests on Apollo boilerplates. Author

**N70-35728\*#** National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.

**MASK BREATHING SYSTEM FOR THE APOLLO COMMAND MODULE**

Donald F. Price and Roger N. Tanner 30 Jun. 1967 18 p *Its Program Apollo Working Paper No. 1319*  
 (NASA-TM-X-64441) Avail: CFSTI CSCL 06K

An auxiliary mask breathing system can provide shirtsleeve crewmen sufficient breathing time to don suits and connect to the suit circuit in the event of cabin atmosphere contamination. The proposed mask system consists of a manifold block containing a three-position mode selector valve, an oxygen purge valve, a suit hose connector to mate with the existing suit hoses, an auxiliary connector to mate with the suit hose connector on the spacecraft, two disconnects to mate with the mask hoses, and a quick disconnect for connection of a purge utility line assembly. Author

**N70-35733\*#** National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.

**INVESTIGATION OF THE FEASIBILITY OF UTILIZING A STEAM TURBINE IN THE LEM ENVIRONMENTAL CONTROL SYSTEM**

James Travis Brown 15 Nov. 1963 30 p refs *Its Program Apollo Working Paper No. 1103*  
 (NASA-TM-X-65008) Avail: CFSTI CSCL 06K

Utilization of an evaporative coolant as an expendable heat sink for thermal management of environmental control systems in space applications for incorporation of a turbine utilizing exhaust vapor for power generation is reviewed. The feasibility and merit of integrating a steam turbine as prime mover of an atmospheric circulation system in the lunar excursion module were studied. It is concluded that this integration yields a reduction in the environmental control system weight (through electric power and expendable conservation). Atmospheric circulation rates may be controlled automatically within the expected operating range of the lunar landing mission. Author

**N70-35749\*** National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.

**OPERATIONAL ASPECTS OF SIMULATING WEIGHTLESSNESS BY USE OF THE WATER IMMERSION TECHNIQUE**

David C. Schultz and John H. Covington 15 Nov. 1967 35 p refs *Its Gen. Working Paper No. 10075*  
 (NASA-TM-X-64428) Avail: CFSTI CSCL 05I

The water immersion technique simulates weightlessness by providing the immersed subject six degrees of freedom of motion. This freedom of motion is identical to that experienced in space. The main advantage of the water immersion technique over other methods of simulating weightlessness is that it permits continuous performance of the total task, while not limiting the subject's operating environment by the use of cables or suspension rigs. The technique was found to be particularly applicable to the

problems of extravehicular activity body restraint and positioning. The validity of the technique in solving these problems as well as assessing workloads was confirmed by Gemini in-flight results and postflight evaluation. Recognition of the value of the technique in simulation of the total extravehicular activity experience during the Gemini Program has brought the technique to its present status, which is one of prime importance in the training of Apollo crews for extravehicular activity and the evaluation of extravehicular activity flight plans. Author

**N70-35788\*#** National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.

**MISSION TRAINING PROGRAM FOR THIRD MANNED APOLLO MISSION**

John J. Van Bockel 12 Dec. 1967 32 p refs  
 (NASA-TM-X-65047; MSC-IN-CF-D-67-12) Avail: CFSTI CSCL 05I

Approximately 1800 hours of crew training is programmed to achieve a highly skilled crew to fly the third manned Apollo mission. In addition to the programmed training, each crew member will spend many additional hours participating in other training activities i.e., physical exercise, study, informal briefings and reviews, and necessary mission support activities. Nonprogrammed activities will largely have to be accomplished prior to or after the normal working day. Therefore, optimum utilization of the time available for crew training is a necessity in order to achieve the training program as contained in this document. Author

**N70-35803\*#** National Aeronautics and Space Administration. Manned Spacecraft Center, Langley Station, Va.

**WATER MANAGEMENT DURING FLIGHT OF THE APOLLO SPACECRAFT. PROJECT APOLLO**

James F. Saunders, Jr. and Walter W. Guy 19 Dec. 1961 8 p *Its Program Apollo Working Paper No. 1034*  
 (NASA-TM-X-64445) Avail: CFSTI CSCL 13B

Studies to establish a water-management program for the Apollo lunar-landing mission are reported. In-flight sources of water are made available from the fuel-cell system and cabin condensate. Water is required for evaporative cooling in certain phases of the mission as well as to satisfy the crew's metabolic and sanitary requirements. It is concluded that the water supply at lift-off will be only the amount required in case of an immediate-abort condition. The in-flight requirements will be more than met by the water produced in the fuel-cell system. Management of the excess fuel-cell water, cabin condensate, and initial water provide a source of supplemental cooling. Author

**N70-35804\*#** National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

**PROJECT APOLLO: THE EFFECT OF THE SELECTION OF THE CABIN PRESSURE ON THE ENVIRONMENTAL CONTROL SYSTEM**

James F. Saunders, Jr. 19 Dec. 1961 22 p refs *Its Program Apollo Working Paper No. 1035*  
 (NASA-TM-X-65009) Avail: CFSTI CSCL 06K

The factors used in evaluating the effect of a cabin pressure of 7 psia on the Environmental Control System for the 14-day Apollo mission are reviewed. The results show that the system operating at 7 psia will supply sufficient air to meet the metabolic and cooling requirements without a significant system weight penalty. Author



N70-35826\*# National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.

**MISSION TRAINING PROGRAM FOR THE APOLLO LUNAR LANDING MISSION**

Robert C. Kohler and Lloyd Reeder 20 Dec. 1968 61 p refs (NASA-TM-X-65078; MSC-IN-CF-D-68-28) Avail: CFSTI CSCL 051

Approximately 2300 hours of crew training was programmed to develop a highly skilled crew to fly the Lunar Landing Mission. In addition to the programmed training, each crewmember spent many additional hours participating in other training activities, i.e., physical exercise, study, informal briefings and reviews, and necessary mission support activities (A/C flying, suit fits, pilot meetings, travel, physical examination, mission development). Nonprogrammed activities largely had to be accomplished prior to or after the normal working day, therefore, optimum utilization of the time available for crew training was a necessity in order to complete the training program. Author

N70-35857\*# National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.

**CREW TRAINING PROGRAM FOR LTA-8 THERMAL VACUUM TEST**

Robert C. Kohler and Texas M. Ward 12 Dec. 1967 19 p refs (NASA-TM-X-65082; MSC-IN-CF-D-67-8) Avail: CFSTI CSCL 051

The completion of the formal training program (approximately 400 hours) prepares the crew for participation in the thermal vacuum testing of the lunar module. Coincident with the formal training are the many hours of crew participation in design reviews, acceptance reviews, informal briefings, study, physical conditioning and support activities such as flying proficiency, suit fits, etc. The sum total of all activities, complementary in nature, aids the crew in developing a level of proficiency necessary for participation in the extensive test program as required by environmental ground operations procedures. Author

N70-35877\*# Avco Corp., Lowell, Mass. Space Systems Div. **A STUDY OF THE POSSIBLE MOVEMENT OF MICROORGANISMS THROUGH SMALL ORIFICES** Final Report

[1968] 69 p (Contract NAS1-7277) (NASA-CR-66703; AVSSD-0219-68-RR) Avail: CFSTI CSCL 06M

The specific investigation carried out is concerned with an a priori bacterial violation of a bio-barrier. The work was restricted to the violation challenge by bacteria approaching at low velocity (less than 10 ft/sec.) a small round hole issuing an opposing gaseous fluid flow at velocities from zero to sonic. Postulation of conditions that would cause bacterial approach velocities orders of magnitude higher than utilized in this investigation can quite easily be made. Similarly, as only quasi-static force fields have been considered in this work, dynamic or oscillatory force fields that may result in violation can be postulated when consideration is made of a typical vehicle mission profile. Author

N70-35915\*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

**SIMULATION TEST REPORT FOR MASS TRANSFER OF STOWAGE BOXES THROUGH THE AIRLOCK MODULE**

12 Sep. 1969 31 p (NASA-TM-X-53887) Avail: CFSTI CSCL 05E

This report contains the basic data gathered for the evaluation of package transfer through the airlock module mock-up. Results indicate the most detectable difference in the positioning of the handles was attributed to hydrodynamic drag. When traversing through the mock-up with the 67.59 kg box, vision was slightly obstructed with the handle placed in the center position. Visibility was increased when the handle was placed on the edge of the box. The appendix presents the procedure and results of an experiment conducted to determine the effects of water drag on the boxes. Author

N70-35931\*# Sandia Corp., Albuquerque, N. Mex. Planetary Quarantine Dept.

**PLANETARY QUARENTINE PROGRAM Quarterly Progress Report, Period Ending 30 Jun. 1970**

30 Jun. 1970 75 p (NASA Order W-12853) (NASA-CR-110046; QPR-17) Avail: CFSTI CSCL 06M

Experimental activities in thermoradiation sterilization fell into three primary categories. First, further low temperature work was undertaken. Of particular significance was thermoradiation sterilization of *B. subtilis* var. *niger* spores at 60 C with simultaneous gamma radiation at 8 Krads/hr. The D value for this combined environment was found to be 6 hours. The D value in dry heat alone is in excess of 53 hours at 60 C. The second area of work was embedded spores. Spores were embedded in methylmethacrylate and then exposed to thermoradiation environments at 105 C and varying dose rates. A synergism apparently comparable percentage-wise to that found for surface contamination was observed. Thus one D value for embedded spores at 105 C and 12 Krads/hr was essentially the same as the dry heat D value for exposed organisms at 105 C without the radiation added. Finally, brief studies were undertaken by other organizations to investigate any deleterious effects of thermoradiation on typical electronic devices and materials and to determine the feasibility of building a relatively inexpensive thermoradiation chamber large enough to handle a Viking spacecraft. Author

N70-35982# Joint Publications Research Service, Washington, D.C.

**PHYSIOLOGICAL MEASUREMENTS IN SPACE AND THEIR AUTOMATION**

R. M. Bayevskiy 20 Jul. 1970 127 p refs Transl. into ENGLISH from the book 'Fiziologicheskiye Izmereniya v Kosmose i Problema Ikh Avtomatizatsii' Moscow, Nauka, 1970 (JPRS-50977) Avail: CFSTI

**CONTENTS:**

1. PRINCIPLES FOR DESIGNING A SPACESHIP SYSTEM FOR PHYSIOLOGICAL MEASUREMENTS AND THE AUTOMATION PROBLEM p 4 - 33 (See N70-35983 19-05)
2. METHODS OF PHYSIOLOGICAL RESEARCH AND SOME ALGORITHMS FOR THE AUTOMATIC PROCESSING OF DATA p 34 - 86 (See N70-35984 19-05)
3. SOME PROBLEMS IN PHYSIOLOGICAL MEASUREMENTS DURING INTERPLANETARY FLIGHTS p 87 - 101 (See N70-35985 19-05)

N70-35983# Joint Publications Research Service, Washington, D.C.

**PRINCIPLES FOR DESIGNING A SPACESHIP SYSTEM FOR PHYSIOLOGICAL MEASUREMENTS AND THE AUTOMATION PROBLEM**



*In its Physiol. Meas. in Space and Their Automation* 20 Jul. 1970  
p 4-33 (See N70-35982 19-05)  
Avail: CFSTI

Biological telemetry uses output data of automatic medical monitoring systems and medical research systems to obtain physiological indices under spaceflight conditions. This includes data transmission to the earth, indication and storage of information onboard the spaceship, and a combination of the onboard computer with biological control and signaling devices. Specific approaches for forming diagnostic algorithms contain the need to minimize input formation and to incorporate data on the development and course of dangerous states and diseases. G.G.

**N70-35984#** Joint Publications Research Service, Washington, D.C.

**METHODS OF PHYSIOLOGICAL RESEARCH AND SOME ALGORITHMS FOR THE AUTOMATIC PROCESSING OF DATA**

*In its Physiol. Meas. in Space and Their Automation* 20 Jul. 1970  
p 34-86 (See N70-35982 19-05)  
Avail: CFSTI

Various methods for measuring, quantizing, and autocorrelating physiological indices of astronauts during flight stress are outlined and algorithms are proposed for computer evaluation of obtained data. Briefly described are observation methods for the cardiovascular system, the external respiration function, the neuromuscular system performance, and the vestibular apparatus. G.G.

**N70-35985#** Joint Publications Research Service, Washington, D.C.

**SOME PROBLEMS IN PHYSIOLOGICAL MEASUREMENTS DURING INTERPLANETARY FLIGHTS**

*In its Physiol. Meas. in Space and Their Automation* 20 Jul. 1970  
p 87-101 (See N70-35982 19-05)  
Avail: CFSTI

Routine medical monitoring on an interplanetary ship must take place periodically and also at specific times if possibilities of dangerous deviations seem indicated. Of utmost importance is the participation of a physician as a crew member in attendance. The design of diagnostic systems on spaceships required not only a physician but also: (1) a medical monitoring system; (2) a medical research system; (3) a physician's panel; (4) an onboard specialized computer; (5) a radiotelemetric system; and (6) a memory system. G.G.

**N70-36013\*#** Translation Consultants, Ltd., Arlington, Va.  
**GEOCHEMICAL ECOLOGY OF SILT AND SOIL MICROFLORA [GEOKHIMICHESKAYA EKOLOGIYA ILOVOY I POCHVENNOY MIKROFLORY]**

S. V. Letunova Washington NASA Aug. 1970 6 p refs Transl. into ENGLISH from the book 'Abiogenez i Nachal'nyye Stadii Evolyutsii Zhizni' Moscow, Nauka Press, 1968 p 198-201 (Contract NASw-2038)

(NASA-TT-F-13197) Avail: CFSTI CSCL 06M

The reduction capacity of various microorganisms found in silt and soil deposits taken from different biochemical regions, and containing greater or lesser concentrations of certain chemical elements is investigated. Their adaptability to changes in concentration is also studied. Author

**N70-36014\*#** Agence Tunisienne de Public-Relations, Tunis.

**ON THE MECHANISMS CONTROLLING THE ORIENTATION OF SIDE ROOTS AND OTHER PLAGIOTROPIC PLANT PARTS [UEBER DIE RICHTUNGSURSACHEN DER SEITENWURZELN UND EINIGER ANDERER PLAGIOTROPER PFLANZENTHEILE]**

Friedrich Czapek Washington NASA Aug. 1970 63 p refs Transl. into ENGLISH from Sitz.-Ber. der Akad. der Wiss. Vienna, Abt. 1, Mathematisch, CIV, 1895 p 1197-1259 Sponsored jointly by NASA and NSF

(NASA-TT-F-12639) Avail: CFSTI CSCL 06C

The mechanisms which control the orientation of first rank secondary roots in a geotropic critical angle are explained. Other plagiotropic organs, particularly horizontal rhizomes and runners, are also included. The analogies between the mechanisms controlling the orientation of horizontal rhizomes are discussed. Emphasis is given to the orientation of subterranean plagiotropic plant parts. R.B.

**N70-36024#** Congress. Senate. Committee on Public Works.  
**THE COST OF CLEAN AIR: FIRST REPORT OF THE SECRETARY OF HEALTH, EDUCATION, AND WELFARE TO THE CONGRESS OF THE UNITED STATES**

Washington GPO Jun. 1969 55 p refs Presented to Comm. on Public Works, 91st Congr., 1st Sess., 16 Oct. 1969 Prepared by Dept. of HEW. Natl. Air Pollution Control Admin.

(S-Doc-91-40) Avail: US Capitol, Senate Document Room

Cost estimates for air pollution control under the Air Quality Act (Public Law 90-148) during fiscal years 1970-74 are provided. It is estimated that governmental expenditures for air pollution control programs will grow at an annual rate of about 30 percent. Estimates of industrial spending were developed for fuel combustion and industrial process sources in 85 metropolitan areas. These estimates pertain to the control of sulfur oxides and particulate emissions from steam-electric powerplants and industrial and commercial fuel-burning facilities. Author

**N70-36025#** Congress. Senate. Committee on Public Works.  
**PROGRESS IN THE PREVENTION AND CONTROL OF AIR POLLUTION: SECOND REPORT OF THE SECRETARY OF HEALTH, EDUCATION, AND WELFARE TO THE CONGRESS OF THE UNITED STATES**

Washington GPO Jan. 1969 67 p refs Presented to Comm. on Public Works, 91st Congr., 1st Sess., 4 Mar. 1969 Prepared by Dept. of HEW. Natl. Air Pollution Control Admin.

(S-Doc-91-11) Avail: US Capitol, Senate Document Room

Progress is reviewed in the following areas: (1) control technology research and development (stationary sources, meteorological research, health effects, and economic factors); (2) control program support (control agency development and research grants); (3) progress toward a regional approach to air pollution control; (4) federal abatement activities; (5) automotive air pollution; and (6) air pollution monitoring, data acquisition, measuring, and instrumentation. E.C.

**N70-36036#** Joint Publications Research Service, Washington, D.C.

**STUDY OF PRINCIPLES OF INFORMATION PROCESSING IN THE VISUAL SYSTEM**

11 Aug. 1970 18 p refs Transl. into ENGLISH from the book 'Issledovaniye Printsipov Pererabotki Informatsii v Zritel'noy Sisteme' Leningrad, 1970 p 4 ANO 77-86

(JPRS-51142) Avail: CFSTI

Developed is a neuron reticulum model that represents impulse activities resulting from five levels of steady illumination. The subsystem of the evaluation of brightness consists of two parts, each of which accomplishes information conversion operations. The first part performs primary information processing, with the result that informative criteria are formed; the second part performs only classification. The criterion for classification is the size of the zone of stimulation (the number of stimulated neurons). The form of the discriminant signal functions is determined by the neuron properties which acquire their capacity to classify during training. G.G.

**N70-36053\***# National Aeronautics and Space Administration. Electronics Research Center, Cambridge, Mass.

**METHOD FOR THE REPAIR AND MAINTENANCE OF DENTALENAMEL**

Bernard Rubin and James D. Childress, inventor (to NASA) Filed 26 Jun. 1970 9 p (NASA-Case-ERC-10338; US-Patent-Appl-SN-50339) Avail: CFSTI CSCL 06E

A process for the preparation of calcium phosphate salts wherein a calcium phosphate salt is deposited from a gel medium onto the surface of a tooth. The use of the gel diffusion process to deposit the constituents of tooth enamel onto the surface of a weak or damaged tooth and thereby effect repair of the tooth is disclosed. NASA

**N70-36107#** RAND Corp., Santa Monica, Calif. **PERFORMANCE GRAMMARS**

Martin Kay Jun. 1970 17 p refs Presented at the NSF Seminar on the Construct. of Complex Grammars, Cambridge, Mass., Jun. 1970 (P-4391) Avail: CFSTI

An investigation of certain aspects of linguistic performance is discussed. The construction of a machine with which it would be possible to hold conversations very closely approximating human discourse is considered. The machine would have the capability of understanding ordinary sentences and formulating new ones. Structural semantics are discussed in relation to inference and syntax. The need to establish distinguishers and semantic markers for aspects of meaning is cited. Incompatibility, antonymy, and hyponymy are also considered as well as implication and equivalence. J.M.

**N70-36110\***# Techtran Corp., Glen Burnie, Md. **THE EFFECT OF 3-METHYLISOXAZOLE-5-CARBONIC ACID ON METABOLISM AND THERMOREGULATION OF MICE EXPOSED TO COLD [DER EINFLUSS VON 3-METHYLISOXAZOL-5-CARBONSAERE AUF STOFFWECHSEL UND WARMEBILDUNG KAELTEEXPONIERTER MAUSE]**

C. J. Estler et al Washington NASA Aug. 1970 10 p refs Transl. into ENGLISH from Arzneimittel-Forsch. (Aulendorf), v. 20, no. 4, 1970 p 483-485 (Contract NASw-2037) (NASA-TT-F-13158) Avail: CFSTI CSCL 06C

The influence of 3-methylisoxazol-5-carbonic acid (MICS) on thermoregulation and the intermediate metabolism of liver and skeletal muscle was investigated in cold-exposed mice. When exposed to 0 C the warm-adapted controls increased their total metabolism by almost 100%. Thus 78% of the animals were able to maintain their body temperature and survive four hours of

exposure to cold. After treatment with MICS the total metabolism of the cold-exposed animals rose by only 50%, and during four hours of exposure to cold 43% of the MICS-treated animals died of hypothermia. The primary reason for the inhibition of cold-induced hypermetabolism seems to be a blockage of glycogenolysis in liver and skeletal muscle. As a consequence of the derangement of the carbohydrate metabolism in skeletal muscle, the utilization of fatty acids is impaired. Author

**N70-36132\***# Translation Consultants, Ltd., Arlington, Va. **EVOLUTION OF THE CHOLINERGIC MEDIATORY PROCESS IN MOLLUSKS [EVOLYUTSIYA KHOLINERGICHESKOGO MEDIATORNOGO PROTSESSA U MOLLYUSKOV]**

D. A. Sakharov et al Washington NASA Aug. 1970 8 p refs Transl. into ENGLISH from the Publ. Abiogenez i Nachannye Stadii Evolyutsii Zhizni' Moscow, Nauka Press, 1968 p 154-158 (Contract NASw-2038) (NASA-TT-F-13192) Avail: CFSTI CSCL 06C

The effect of cholinesterase on acetylcholine at the synapses of various types of mollusks using tests carried out on excised hearts from representative species is presented. The effect of enzyme hydrolysis on the postsynaptic potential is also considered. Author

**N70-36133\***# Translation Consultants, Ltd., Arlington, Va. **THE GEOCHEMICAL ECOLOGY OF PLANTS [GEOKHIMICHESKAYA EKOLOGIYA RASTENIY]**

N. S. Petrulina Washington NASA Aug. 1970 8 p refs Transl. into ENGLISH from the publ. 'Abiogenez i Nachannye Stadii Evolyutsii Zhizni' Moscow, Nauka Press, 1968 p 202-206 (Contract NASw-2038) (NASA-TT-F-13198) Avail: CFSTI CSCL 06C

The effects of abnormal amounts of certain metals in the soil on plant ecology is considered. Whether or not a species of plants will survive, mutate or become extinct depends on whether it is adaptable or inadaptible, a concentrator or nonconcentrator. Author

**N70-36149#** Federal Water Pollution Control Administration, Washington, D.C. Technical Studies Branch.

**THE PRACTICE OF WATER POLLUTION BIOLOGY**

Kenneth M. Mackenthun 1969 293 p refs Avail: Issuing Activity

Practical biological field investigative techniques and practices of water pollution are presented for broadening understanding of this discipline. The changes in the aquatic life as pollution increases in the aquatic environment are presented. Other topics discussed include: water quality constituents, solving a field water quality problem, organic wastes in rivers, silts, toxic materials, acid mine wastes, radioactive wastes, water treatment, and waste treatment. F.O.S.

**N70-36151#** Committee on Interior and Insular Affairs (U. S. Senate).

**NATIONAL ENVIRONMENTAL POLICY**

Washington GPO 1969 238 p refs Hearings on S. 1075.



S. 237, and S. 1752 before Comm. on Interior and Insular Affairs, 91st Congr., 1st Sess., 16 Apr. 1969

Avail: Comm. on Interior and Insular Affairs

Congressional testimony is reported on bills S. 1075, S. 237, and S. 1752 to authorize the Secretary of the Interior to conduct investigations, studies, surveys, and research relating to the nation's ecological systems, natural resources, and environmental quality, and to establish a Council on Environmental Quality.

R.B.

**N70-36154#** Congress. House. Committee on Interstate and Foreign Commerce.

**AIR POLLUTION CONTROL RESEARCH INTO FUELS AND MOTOR VEHICLES**

Washington GPO 1969 127 p refs Hearing on H.R. 12085 before Comm. on Interstate and Foreign Com., 91st Congr., 1st Sess., 19 Jun. 1970 /ts Serial 91-17

Avail: Subcomm. on Public Health and Welfare

Statements and reports on air pollution control program activities, current and projected research, and environmental problems are presented. Abatement activities and data pertaining to motor vehicle, aircraft engine, and diesel engine exhausts, and industrial wastes are discussed. Air pollution abatement by federal facilities is also covered.

N.E.N.

**N70-36211#** Mount Sinai Hospital, New York. Dept. of Pathology.

**HEPATIC SUBCELLULAR EFFECTS OF ALTERED ATMOSPHERES Final Report, Dec. 1965 - Nov. 1967**

Fenton Schaffner and Franklin M. Klion Nov. 1969 22 p refs

(Contract AF 33(615)-3464)

(AD-705220; AMRL-TR-67-231) Avail: CFSTI CSCL 6/19

Liver tissues of rats, dogs and monkeys were examined electron microscopically after exposure to pure oxygen at pressures varying from 258-2280 mm Hg for periods of time from 15 minutes to 8 months. Results of these were compared in many instances with similar tissue from animals exposed to two-gas atmospheres. The studies indicate that mitochondria in liver cells are altered, but that adaptation to the altered atmosphere occurs. Adaptation in the liver is complete with no evidence of damage.

Author (TAB)

**N70-36232#** Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

**QUANTITATIVE CONTENT OF MICROORGANISMS IN HIGH ATMOSPHERIC LAYERS**

Ya. G. Kishko 26 Feb. 1970 12 p refs Transl. into ENGLISH from Mikrobiol. Zh., Akad. Nauk Ukr. RSR (Kiev), v. 22, no. 6, 1960 p 77-81

(AD-703889; FTD-HT-23-24-70) Avail: CFSTI CSCL 6/13

From May to September 1957 bacteriological investigations of high altitude air in a vertical section were conducted. Air samples were collected by mounting in the window of an Li-2 sounding aircraft a collector in which a Petri dish with a nutrient medium was placed during the investigations. Twenty-five flights were made under various meteorological conditions. As the results of investigations showed most inseminated with microorganisms was the air layer adjoining the earth up to 500 m (846-624 colonies in 1 m(superscript 3) of air). With altitude the quantity of

microorganisms decreased at an altitude of 3000 m by eight times, at an altitude of 7000 m by more than 100 times. It was also noticed that under the conditions of the high layers of the atmosphere there exists a definite relationship in the content of microorganisms with the humidity of the air- the dryer the air, the less microorganisms are in it. Clouds, as observations have shown, contained a greater amount of microorganisms. If the content of microorganisms in a cloud level for 264 colonies in 1 m(superscript 3) of air is taken as the standard at 100 percent, then in clouds it was equal to 215.1 percent and above the clouds only 53.7 percent.

Author (TAB)

**N70-36244#** Melpar, Inc., Falls Church, Va  
**STUDY OF ADAPTIVE MATHEMATICAL MODELS FOR DERIVING AUTOMATED PILOT PERFORMANCE MEASUREMENT TECHNIQUES. VOLUME 1: MODEL DEVELOPMENT Final Report, Jan. 1968 - Jan. 1969**

Edward A. Connelly, Alfred R. Schuler, and Patricia A. Knoop Oct. 1969 316 p refs

(Contract F33615-68-C-1278)

(AD-704597; AFHRL-TR-69-7-Vol-1; Rept-8054) Avail: CFSTI CSCL 5/9

The report documents research on a new approach to deriving human performance measures and criteria for use in automatically evaluating trainee performance. The ultimate application of the research is to provide methods for automatically measuring pilot performance in a flight simulator or from recorded in-flight data. An efficient method of representing performance data within a computer is described. A system of adaptive mathematical and computer models is developed to examine representative performance data corresponding to known skill-levels and to independently develop a unique method of performance evaluation. Three types of models are developed, each of which is designed to derive and use (in an adaptive performance evaluation scheme) unique types of performance measures.

Author (TAB)

**N70-36249#** Aerospace Medical Div. Aeromedical Research Lab. (6571st), Holloman AFB, N.Mex.

**MEASUREMENT OF HEAD ANGULAR ACCELERATION DURING IMPACT**

Charles D. Bendixen Mar. 1970 18 p refs

(AD-704704; ARL-TR-70-5) Avail: CFSTI CSCL 6/19

The incidence of cerebral concussion incurred during impact conditions has been shown to be related to the levels of angular acceleration which a head undergoes during impact. Also, since the forces causing angular acceleration of the head during impact are transmitted by neck structures, measurement of head angular accelerations may give a good indication of neck injury potential in various impact situations. Studies relating these injuries to head angular acceleration values have been hampered in the past by the lack of an accurate technique for measuring angular acceleration. We have developed a system employing linear accelerometers mounted on the subjects head and oriented in such a manner that the tangential acceleration of one point on the head is found relative to another point and subsequently angular acceleration is determined. This system has shown improved accuracy in angular acceleration measurement over previously used methods and should aid in the study of head and neck injuries during impact.

Author (TAB)

**N70-36272#** Hull Univ. (England). Dept. of Biochemistry.  
**THE ENDOGENOUS METABOLISM OF ANAEROBIC BACTERIA Final Technical Report, May 1968 - Sep. 1969**

E. A. Dawes, P. J. Large, J. Bexon, J. G. Morton, and S. Murden

Dec. 1969 30 p refs  
(Contract DAJA37-67-C-0567)  
(AD-703930) Avail: CFSTI CSCL 6/13

Studies of the endogenous metabolism and survival of the non-spore-forming anaerobic bacteria *Zymomonas anaerobia* and *Peptococcus prevotii* under conditions of starvation have been continued. The nutritional requirements of *Z. anaerobia* have been further delineated in order that the organism might be grown under defined conditions. Response curves for biotin and lipoic acid, shown to be essential for growth, revealed that their action is not additive and that together they are not so effective as a mixture containing nine additional vitamins. A detailed survey of the amino acid requirements showed that the organism is more exacting than the related *Zymomonas mobilis* and growth on ammonium salts is very poor. The ATP content of *P. prevotii* during growth has been studied and the effect of washing cells prior to analysis examined. The ability to ferment serine during prolonged starvation was gradually lost over a period of 48 hrs, correlating with previously observed response of ATP production to pulses of serine. Extracts of *P. prevotii* contain acetate kinase and phosphotransacetylase and these enzymes have been studied. Author (TAB)

N70-36291# Gesellschaft fuer Strahlenforschung m.b.H., Munich (West Germany). Inst. fuer Biologie.

**PATHOGENESIS OF GENETIC AND SOMATIC RADIATION DAMAGE** Final Annual Report, 1965-1967 [PATHOGENESE GENETISCHER UND SOMATISCHER STRAHLENSCHADEN. ABSCHLUSSBERICHT UEBER DIE WISSENSCHAFTLICHE TAEITIGKEIT IN DEN JAHREN 1965-1967 (ZUGLEICH JAHRESBERICHT 1967)]

Luxemburg EURATOM Apr. 1970 22 p In GERMAN; ENGLISH summary /Its Assoc. No. 045-65-1 BIAD  
(EUR-4405.d) Avail: CFSTI

Experimental studies on the frequency and origin of somatic and genetic radiation damage from irradiation administered externally or after incorporation of radioactive nuclides are reported. The research covers selected problems in the radiation genetics of vertebrates, neurophysiological studies and behavioral studies, and radiotoxicity. Author

N70-36301# Naval Air Development Center, Johnsville, Pa. Aerospace Medical Research Dept.

**RENAL HEMODYNAMIC RESPONSE OF UNANESTHETIZED DOGS TO NEGATIVE ACCELERATION**

John E. Chimoskey 2 Mar. 1970 25 p refs  
(AD-702745; NADC-MR-7002) Avail: CFSTI CSCL 6/19

Trained unanesthetized dogs were exposed to negative centrifugal accelerations up to -3Gz. Renal arterial pressure and inferior vena cava pressure at kidney level were measured through indwelling catheters. Renal blood flow velocity was measured by a Doppler flow meter. The flow signal was telemetered and the pressure signals were transferred by slip rings from the centrifuge. About 10 days after the sensing devices were implanted under pentobarbital anesthesia, the experiments began for which the dogs were unanesthetized. Renal blood flow velocity decreased in proportion to the magnitude of -Gz. The minimum flow velocity was significantly lower during -3Gz than it was during -1 and -2Gz. By the end of the 27 to 30 second periods of constant -Gz, flow velocity recovered significantly from the minimum values. The lowest mean arterial-venous pressure gradient, 129 plus or minus 7 (S.E.) mm Hg, recorded during -3Gz, did not differ significantly from the mean preacceleration value. Calculated intrarenal resistance to blood flow increased. Flow velocity reductions on a given day were frequently smaller after the first acceleration. Author (TAB)

N70-36340# Harris Research Labs., Inc., Rockville, Md.  
**THE COMFORT AND FUNCTION OF CLOTHING** Technical Report, 1941-1969

Lyman Fourt and Norman R. S. Hollies Natick, Mass. Army Natick Labs. Jun. 1969 304 p refs  
(Contract DAAG17-67-C-0139)

(AD-703143; TS-162; TR-69-74-CE) Avail: CFSTI CSCL 15/5

The matters discussed are: clothing as a quasi-physiological system interacting with the body; means of describing the thermal and moisture relations and experimentally determining characteristic coefficients of clothing; the more usual structural description of clothing, and some of the possible variations of its structure or design; heat and moisture relations in clothing; physiological and field testing of clothing by wearing it; properties of clothing that require tests on living subjects; means of testing physical properties of clothing which are related to comfort; differences between fibers in relation to comfort, both thermal or moisture relations and nonthermal. Author (TAB)

N70-36362\*# Indiana Univ., Bloomington. Div. of Optometry.  
**THE VISUAL STANDARDS FOR THE SELECTION AND RETENTION OF ASTRONAUTS**

Merrill J. Allen, David P. Austen, Arthur E. Jones, John R. Levene, and Stanley Miller Jun. 1970 124 p refs  
(Contract NAS9-9665)

(NASA-CR-108587) Avail: CFSTI CSCL 06N

The purpose is to determine the origin and adequacy of the vision standards being used for the selection and retention of astronauts and scientist astronauts. A broad based literature search was carried out to evaluate the adequacy of vision test standards. The voluminous literature is indicated by the abstracts included in this report. The coverage of the literature is not exhaustive but does include the main publications on vision standards for aviators. From the literature it is apparent that many of the vision tests and procedures are inadequate or out of date and that certain physiological aspects of vision that are of importance to aviators and astronauts have been neglected or overlooked. The primary oversight of immediate concern relates to testing for near vision capabilities. Author

N70-36364# Naval Air Development Center, Johnsville, Pa. Aerospace Crew Equipment Dept.

**DESCRIPTION AND EVALUATION OF A PORTABLE DRY-ICE WATER-CONDITIONED SUIT SYSTEM FOR AIRCREW MEMBERS** Interim Report

John J. Esposito 6 Nov. 1969 23 p refs  
(AD-700915; NADC-AC-6906) Avail: CFSTI CSCL 6/17

A portable water-conditioned suit system, employing a dry-ice cooler designed and constructed at the Naval Air Development Center and a commercially available water-cooled vest, was evaluated by exposing two sitting-resting subjects at sea level pressure to environments of 105F and 115F. Tests were conducted with and without the cooling system. Sublimation of approximately fifteen pounds of dry-ice kept the subjects relatively free from evidences of heat stress for periods of four hours at 115F. Based on a comparison with a wet-ice system, the dry-ice portable cooler, possessing significant advantages in terms of size and weight, produced equivalent cooling of the subjects. Author (TAB)

N70-36394# Eidgenossische Technische Hochschule, Zurich (Switzerland).

**THE IMPORTANCE OF TOPOLOGICAL CHARACTERISTICS FOR THE STEREOSCOPIC RECOGNITION OF ACCIDENTAL**

**PATTERNS [DIE BEDEUTUNG TOPOLOGISCHER CHARAKTERISTIKA BEI DER STEREOSKOPISCHEN WAHRNEHMUNG VON ZUFALLSMUSTERN]**

Hans Rudolf Monig (Ph.D. Thesis) Goettingen, W. Germany 1969 42 p refs In GERMAN; ENGLISH summary (DISS-4259) Avail: CFSTI

Random-dot stereo images of white and black picture elements (generated by computer) were presented to the subjects in a stereotachistoscope (exposure time: 200 ms) in order to study quality of stereopsis as a function of the frequency of white elements. The results suggest that the quality of stereopsis under tachistoscopic conditions is influenced by topological properties of the random-dot patterns (varying with the frequency of white elements) concerning cluster formation (connectivity of adjacent elements). These properties are different from the common notion texture abundance that reaches the maximum at 50% white picture-elements. Author

**N70-36396#** Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

**STATISTICAL CHARACTERISTICS OF IMAGES AS INDICATORS OF FORMS**

I. S. Goryan et al 15 Aug. 1969 13 p refs Transl. into ENGLISH from Vopr. Bioniki (Moscow), 1967, p 118-124 (AD-700581; FTD-HT-23-1410-68) Avail: CFSTI CSCL 6/4

Research by various scientists in the field of distinguishing textures by statistical analysis is reviewed. The study of bees ability to distinguish textures synthesized into statistical patterns by computers is included. The necessity for several parameters (rather than a single one) to make a meaningful texture classification is mentioned, as are methods of calculating surfaces. Work on the statistics of building a visual system is discussed briefly. The use of n-grams and difficulties presented with the increase of n are noted. The results of experiments on the physiology of animal vision are mentioned. TAB

**N70-36397#** Wake Forest Coll., Winston-Salem, N.C. Bowman Gray School of Medicine.

**EVALUATION OF CEREBRAL AND SYMMETRIC VASCULAR DYNAMICS IN RESPONSE TO STRESS Annual Summary Report**

Henry S. Miller, Jr. 1 May 1969 9 p (Contract DA-49-193-MD-2794) (AD-701941) Avail: CFSTI CSCL 6/19

The project was instituted to investigate the vascular dynamics under stress conditions. Transducer techniques were developed for obtaining direct and indirect measurements of the physiological variables under investigation and mathematical techniques for the computer analysis of this data. A 6 Channel recorder was modified for 6 Channel electrocardiogram recording at rest and during active exercise. Atrial pacing, treadmill exercise and drug injections have been used as methods of stressing the cardiovascular system. The electrocardiogram, apexcardiogram, carotid pulse waves, phonocardiography and blood pressure have been done before and after exercise. In patients with known coronary artery disease, intra-arterial pressures, electrocardiogram, and clinical evidence of cerebral and coronary insufficiency are recorded during the stress by rapid atrial pacing. Two groups of 20 subjects have undergone 20 weeks of exercise for physical conditioning, exercising 1 hour four days a week at 60-70% of maximum pre and post training. Treadmill stress and electrocardiogram, O sub 2 consumption and numerous chemistries were recorded. Physical conditioning increased tolerance, maximum oxygen consumption and recovery rate based on the return of pulse rate to normal. Author (TAB)

**N70-36414\*#** Hamilton Standard, Windsor Locks, Conn.

**INDEPENDENT RESPIRATORY SUPPORT SYSTEM Final Report, 2 Sep. 1969 - 31 Mar. 1970**

Douglas C. Howard Mar. 1970 29 p

(Contract NASw-1972)

(NASA-CR-112402; SVHSER-5661) Avail: CFSTI CSCL 06K

Various forms of respiratory and circulatory disease produce chronic hypoxia at metabolic rates above resting. Short-term oxygen therapy will alleviate this condition for time periods up to two or three hours, depending on the severity of the ailment and the level of metabolic expenditure assumed. The objectives were: (1) to define a first-cut system of low weight and volume satisfying a specific level of metabolic support; (2) fabricate three units as defined by the first objective; and (3) define an improved system based on user evaluation of the delivered units and detailed engineering studies. Three units were built having weights of 7.7 lbs and volumes of 210 cubic inches each. One such unit will provide 0.5 to 2.5 liters per minute of 100% oxygen to the nasal passages for durations of 2.5 to 0.5 hours, respectively. The operation of these units to date has been entirely satisfactory. Studies in support of the third objective indicate that optimized system weight and volume goals of 5 lbs and 165 cubic inches are not unreasonable. Additionally, a fluidics circuit would provide a demand capability permitting flows of 1 to 2 liters per minute for time periods up to four hours. Author

**N70-36418#** Pittsburgh Univ., Pa.

**EFFECTS OF HEAT STRESS ON CELLULAR STRUCTURE AND FUNCTION Technical Report, Jan. 1966 - Dec. 1969**

Ralph Buchsbaum, Jack Perchersky, and David Mc Kibben Wright-Patterson AFB, Ohio AMRL Feb. 1970 22 p refs

(Contract AF 33(615)-3375)

(AD-705654; AMRL-TR-70-1) Avail: CFSTI CSCL 6/19

The report demonstrates the effects of heat stress on kidney and liver tissues. It has been found that kidneys stressed to temperatures in excess of 41C undergo progressive damage. Observations utilizing the electron microscope show degenerative effects on cell organelles, especially mitochondria. Whole animals (CF-1 mice) heated in ambient temperatures of 40C to 45C for 30 minutes were used to determine the level at which 50% will survive. This ambient temperature was found to be 42C (LD50). The liver of animals subjected to 43C rectal temperature for varying lengths of time demonstrate various levels of cellular degeneration. Mitochondrial swelling and degeneration, the formation of large lipid droplets and loss of glycogen are typical of heat stressed liver cells. The mitotic index was determined using tritium labelled thymidine. Mitosis is suppressed for a period of 8 to 24 hours after heat-stress near the LD50 temperature, increases to more than twice the control value, and then returns to normal within 3 to 4 days. Author (TAB)

**N70-36431#** Weizmann Inst. of Science, Rehovoth (Israel). Polymer Dept.

**PHYSICAL CHARACTERISTICS OF SYNTHETIC AND NERVE MEMBRANES Final Report, 1 Nov. 1966 - 31 Dec. 1968**

Aharon Katchalsky and Israel R. Miller Jul. 1969 47 p refs (Contract F61052-67-C-0031)

(AD-698816; AFOSR-69-3085TR) Avail: CFSTI CSCL 7/4

The research on this project was carried out along two closely related lines: One line of investigation was devoted to the theoretical analysis of transport processes across membranes using nonequilibrium thermodynamics. In the framework of this project chemico-diffusional coupling was considered and applied to facilitated or carrier transport. The second line of investigation was essentially experimental in approach. (a) In an attempt to construct a well

defined model for very thin biological membranes, the kinetic coefficients for ion permeability through monolayers were determined. The monolayers were adsorbed at the interface between a mercury electrode and water, and the ionic permeability measured polarographically. By this method the transport of  $\text{Cu}^{++}$  across a decylammonium monolayer and its dependence on temperature was investigated. (B) The transport of ions across a composite double membrane was measured as a function of the applied potential. In a membrane composed of cation and anion exchange elements in series, the ionic distribution was studied, and the results analyzed by the methods of nonequilibrium thermodynamics.

Author (TAB)

**N70-36435#** School of Aerospace Medicine, Brooks AFB, Tex.  
**AN ADJUSTABLE HEADHOLDER FOR CALORIC TESTING OF SEMICIRCULAR CANAL FUNCTION** Final Report.  
 May-Jul. 1969

J. W. Wolfe and J. L. Bower Oct. 1969 11 p

(AD-700738; SAM-TR-69-71) Avail: CFSTI CSCL 6/12

A device is described for orienting the head of the patient during caloric examination of vestibular nystagmus. The headholder consists of a hinged wedge of plywood with adjustable head clamps which provide adequate but painless restraint of the head. Kidney-shaped basins, shaped to fit snugly under the ear, catch surplus water from each ear. Whereas data collected from 10 subjects using the standard clinical method of pillow support were highly variable between and within subjects, data obtained from 12 normal subjects using the headholder reflected a reduction in variance and a more symmetrical distribution across conditions.

Author (TAB)

**N70-36449#** Human Resources Research Organization, Alexandria, Va.

**HUM RRO STUDIES IN CONTINUOUS OPERATIONS**

Donald F. Haggard Mar. 1970 15 p refs Presented at the 15th Ann. Army Human Factors Res. and Develop. Conf., Fort Ord, Calif., Nov. 1969 /ts HumRRO Professional Paper No. 7-70

(Contract DAHC19-70-C-0012)

(AD-705705) Avail: CFSTI CSCL 5/5

A laboratory study and a field study were conducted to obtain data on performance decrements on tank crew tasks during 48 hours of continuous combat operations, and to examine the degree of decrement in terms of its effect on tactical efficiency. Experience in the studies illustrates the need for increased efficiency in obtaining human factors information, demanded by the increasing complexity of military tactics and equipment.

Author (TAB)

**N70-36454#** Human Resources Research Organization, Alexandria, Va.

**EVALUATION OF THE INTEGRATED**

**CONTACT-INSTRUMENT CONCEPT FOR ARMY FIXED WING FLIGHT INSTRUCTION**

Wallace W. Prophet and Oran B. Jolley Dec. 1969 108 p refs

(Contract DAHC19-70-C-0012)

(AD-703161; HumRRO-TR-69-26) Avail: CFSTI CSCL 5/9

The report describes the results of an experimental comparison of three primary fixed wing flight training methods: (a) integrated contact-instrument primary flight training administered in a side-by-side seating aircraft; (b) non-integrated primary flight training administered in a side-by-side seating aircraft; and (c) non-integrated primary flight training administered in a tandem-seating aircraft.

Author (TAB)

**N70-36457#** Human Resources Research Organization, Alexandria, Va.

**ORIENTATION SYSTEMS: FIRST THINGS FIRST**

Robert H. Wright Feb. 1970 16 p /ts HumRRO Professional Paper No. 3-70

(Contract DAHC19-70-C-0012)

(AD-705021) Avail: CFSTI CSCL 5/5

The geographic orientation requirement for the Armys lighter aircraft, and for Army aviation as a system, is a system-analysis and system-design problem that appears to have defied solution. The factors considered in this paper indicate that the requirement is not filled simply by a more sophisticated machine system approach. Instead, the man part of the man-machine system needs to be deliberately designed in to contribute his full potential as a functional part of the system. Also, the Army aviation operational environment, with all of its complex interacting coordination requirements, needs to be considered, for an affordable and operationally effective geographic orientation system.

Author (TAB)

**N70-36467#** School of Aerospace Medicine, Brooks AFB, Tex. Internal Medicine Branch.

**EXTERNAL MEASUREMENT OF Fe 59 FERROKINETICS**

Donald F. Logsdon, Jr., James F. Green, and John W. Harper Mar. 1970 12 p refs

(AD-705046; SAM-TR-70-11) Avail: CFSTI CSCL 6/5

A counting system has been assembled for the determination of circulating radioisotope activity by means of external measurement of the ventral surface of the wrist. The system was tested on one patient by performing a ferrokinetics study with  $^{59}\text{Fe}$ , in which both the external counting system and the normal blooddrawing procedure were used. The external counting system proved to be unsuitable for measurement of plasma iron clearance, but was able to measure accurately the percentage uptake of iron into new red cells. The use of the external counting system eliminates the need for 10 of the venipunctures and 70 ml. of blood.

Author (TAB)

**N70-36468#** School of Aerospace Medicine, Brooks AFB, Tex. Pharmacology-Biochemistry Branch.

**EFFECTS OF NITROGEN TRIFLUORIDE ON CARDIOVASCULAR SYSTEM OF RATS**

Lloyd L. Foster Feb. 1970 13 p refs

(AD-705045; SAM-TR-70-8) Avail: CFSTI CSCL 6/20

Rats were exposed for 1 minute to tracheal inhalation of nitrogen trifluoride ( $\text{NF}_3$ ) gas to determine its toxic effects upon the cardiovascular system. These rats had a definite decrease in diastolic pressure, systolic pressure, and heart rate. Similarly, rats that prebreathed oxygen for 5 minutes before exposure had the same changes in the cardiovascular system as those breathing only  $\text{NF}_3$ . However, animals which inhaled oxygen for 5 minutes immediately after exposure to  $\text{NF}_3$  showed a temporary increase in diastolic pressure, systolic pressure, and heart rate.

Author (TAB)

**N70-36473\*#** Microbiological Associates, Inc., Bethesda, Md.

**STUDY OF THE MURINE VIRUSES PRESENT IN 'GERMFREE' MICE** Final Report, 1 Sep. 1968-30 Jun. 1970

John C. Parker 30 Jun. 1970 16 p

(Contract NAS9-8641)

(NASA-CR-108589) Avail: CFSTI CSCL 06M

The NASA germfree mouse colony was established and monitored for indigenous virus infection. Starting with a breeding nucleus and continuing through P sub 3 generation to the expansion colony, no evidence was found for infection with the fol-

lowing viruses: pneumonia virus of mice, mouse pneumonitis, polyoma, Sendai, minute virus of mice, ectromelia, mouse adenovirus, mouse hepatitis, lymphocytic choriomeningitis, Riley, mouse salivary gland virus, thymic or epidemic diarrhea of infant mice. Some equivocal data were obtained with regard to reovirus type 3, and Theiler's encephalomyelitis virus infection, however, it is likely that the mice are not infected with either of these agents. There is infection throughout the colony with mouse leukemia virus. A virus profile analysis was performed on two groups of 150 germfree mice, each taken from a sample of 750 germfree mice used in the Apollo 11 and Apollo 12 missions. Author

**N70-36480#** Sperry Rand Corp., Great Neck, N.Y. Gyroscope Div.

**RESEARCH IN VISUAL PERCEPTION FOR CARRIER LANDING Final Report, 1964-1969**

Theodore Gold and Robert F. Perry Dec. 1969 88 p refs (Contract NONr-4081(00)) (AD-706036; SGD-5265-0327) Avail: CFSTI CSCL 5/10

The effects of ship motion and the Fresnel Lens Optical Landing System (FLOLS) on the accuracy and consistency with which Navy pilots can estimate position on the glide slope and flight path (aim point) during carrier landing were determined. The visual judgements of the pilots were obtained in simulated dusk and night landings. Comparable data were obtained also for landings on a carrier without the presence of angular deck motion. A visual carrier landing simulator which was developed for a previous study was modified to incorporate provisions for carrier deck motion and a stabilized FLOLS. Three qualified carrier pilots with experience as Landing Signal Officers participated as test subjects. More than 5000 data points were collected in the glide slope studies, and about 4000 data points were accumulated in the aim point studies. These data were evaluated by a psychometric technique which permitted independent measures of response bias, sensitivity to changes in stimulus, and variability in response. Author (TAB)

**N70-36493\*** National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.

**LIFE PRESERVER Patent**

Matthew I. Radnofsky and Glenn A. Shewmake, inventors (to NASA) Issued 13 Oct. 1964 (Filed 15 Feb. 1963) 8 p Cl. 9-316 (NASA-Case-XMS-00864; US-Patent-3,152,344; US-Patent-Appl-SN-258932) Avail: US Patent Office CSCL 06G

With the object of fabricating a life preserver which is easily donned, easily discarded, and no hindrance to swimming, a vest made from lightweight flexible materials and without fastening devices of any kind is described. The preserver is comprised of a nylon inflatable structure provided with internal restraining members which cause it, upon being inflated, to assume a ram's horn configuration. The device is provided with an oral inflation tube; a compressed gas cartridge assembly is used for rapidly inflating the preserver. When deflated, the life vest reduces to a small and light compact package. P.A.B.

**N70-36495#** Naval Aerospace Medical Inst., Pensacola, Fla.  
**ANTHROPOMETRIC DETERMINATIONS OF AMERICAN BORN MACACA MULATTA**

Keith A. Clark and Albert E. New 16 Jul. 1969 43 p refs (AD-700907; NAMI-1078) Avail: CFSTI CSCL 6/3

Knowledge of anthropometric parameters of a group of American born Macaca mulatta became necessary for hardware design in the course of an orbiting primate experiment. The values obtained for 35 anthropometric parameters on 23 immature

laboratory-born monkeys are presented. These parameters are classified according to age and sex of the animals and graded as to their reliability and reproducibility. The data can serve as baselines for extensive body measurements of the American born rhesus monkeys and can be useful any time these monkeys are used in experimental procedures. Author (TAB)

**N70-36500#** Air Force Systems Command, Wright-Patterson AFB, Ohio. Foreign Technology Div.

**EVALUATION OF TWO METHODS FOR INSTRUCTING A CLASSIFIER**

Y. Yu Chyarnyuskas et al Sep. 1969 13 p refs Transl. into ENGLISH from Tr. Fiz.-Mat., Khim., Geol. i Tekhn., Akad. Nauk Lit (USSR), no. 2, 1967 p 115-120 (AD-700806; FTD-HT-23-520-68) Avail: CFSTI CSCL 9/2

One of the problems in creating learning recognition systems is selecting a method of instruction which will assure maximum accuracy of recognition at the highest rate of convergence of the instruction process. Two methods of instructing a classifier are compared: the method used in the Adaline system and an instruction system in which the method of stochastic approximation is used. Accuracy of recognition and the convergence rate of the instruction process were selected as criteria for evaluating the quality of instruction. Author (TAB)

**N70-36510#** Flying Personnel Research Committee, London (England).

**AN ASSESSMENT OF INDUSTRIAL SAFETY HARNESSES**

D. C. Reader Jul. 1969 23 p refs (FPRC/MEMO-246) Avail: CFSTI

The range of commercially available safety harnesses and belts was examined to discover the most suitable assemblies for use by personnel servicing large aircraft. The harnesses and belts were assessed for fit, ease of use, and comfort when worn by human subjects during the arrest of a free fall and subsequent suspension. No failures of harnesses or belts were observed during the experiments. It was found that, after modification, the Barrow, Hepburn and Gale Cat. No. 49 harness, the Irving type SH/5 harness and the GQ Safety Harness and Suit are suitable for use by aircraft servicing personnel. Author

**N70-36541#** Naval Medical Research Inst., Bethesda, Md.

**ANALYSIS OF BIOMEDICAL DATA BY TIME-SHARING COMPUTERS. 1: NON-LINEAR REGRESSION ANALYSIS Medical Research Interim Report**

David L. Horwitz and Louis D. Homer 26 Feb. 1970 19 p refs (AD-704858; NAVMED-MR005-20-0287-25) Avail: CFSTI CSCL 12/1

Analysis of biomedical data frequently involves obtaining a mathematical equation to describe numerical data. Because of the nature of biological systems, the desired equations are often not linear. In the past, such non-linear systems were often avoided because mathematical methods for analyzing them were tedious and, occasionally, quite imprecise. Modern computers have made such systems far easier to work with. The publication describes a program for obtaining these non-linear regression equations. The program described has a number of advantageous properties: (1) it can be used for almost any type of equation, including exponential, logarithmic, and power functions; (2) it is written in the BASIC program language, which can be learned by a person without computer knowledge in only a few hours; (3) it is designed for time-sharing computers, so that the user may readily interact

with the computer and modify the equations being used at will; and (4) the output of the program includes sufficient statistical parameters to enable further evaluation of the results. In addition to giving the program, the publication gives full instructions on its use, suggestions for modifying the program for additional applications, and several illustrative examples. TAB

**N70-36546#** Hawaii Univ., Honolulu. Dept. of Microbiology. **OCEAN PHOTOSYNTHESIS. EFFECTS OF HYDROSTATIC PRESSURE ON PHOTOSYNTHESIS AND GROWTH OF UNICELLULAR MARINE ALGAE AND DIATOMS** Annual Progress Report

Leslie R. Berger, Leslie Q. Tam, and Danny H. Pope 1 Apr. 1970 14 p refs

(Contract N00014-67-A-0387-0008)

(AD-704496; APR-1) Avail: CFSTI CSCL 8/1

Photosynthesis, measured as light-dependent evolution of oxygen was demonstrated in both green and blue-green algae species at hydrostatic pressures exceeding 600 atmospheres. The methodology which made these observations possible is described. A technique to grow obligately aerobic organisms at increased pressures to high population densities is also described.

Author (TAB)

**N70-36551#** Naval Medical Research Inst., Bethesda, Md. **THE PERSONALITY CORRELATES OF THE CENTERING OF "SELF" IN THE PHENOMENAL FIELD** Interim Report

Philip Briley Apr. 1970 35 p refs

(AD-705065; MF12.524-003-1005D; Rept-4) Avail: CFSTI CSCL 5/10

The study was designed to explore the relationship between the centrality-of-self in the phenomenal field, as it is symbolically represented and three personality dimensions: personal adjustment, self-confidence, and defensiveness. A two-group repeated measures study was done using United States Navy enlisted men of comparable intelligence, education, age, and marital status. A centrality-of-self score, the distance between the center of the field and the center of the self circle in millimeters, and a Z score on each of the three personality scales were determined for each of the fifty-nine subjects. An analysis of the results indicates that there is sufficient evidence for some support for the first experimental hypothesis, but not the second and third. Some of the reasons for this lack of confirmation were discussed.

Author (TAB)

**N70-36574#** Naval Medical Research Inst., Bethesda, Md. **PROJECT RIM: OBSERVATIONAL DATA COLLECTION** Interim Report

Ira Donenfeld, Seward Smith, William W. Haythorn, John M. Libert, and Martin A. Brown Apr. 1970 28 p refs

(AD-705066; NAVMED-MF12.524-003-1005D) Avail: CFSTI CSCL 5/10

The purpose of the report is to describe the methodology developed on Project RIM to collect a large and systematic body of observational data for small groups confined for 21-day periods. The data collection was accomplished by two techniques: (a) a comprehensive behavior log systematically gathered by trained observers, and (b) the automated recording of video samples. The introductory section includes a brief description of Project RIM and details of the rationale for collecting subtle indices of social-psychological functioning. In subsequent sections, attention is focused on the behavior-log and video-sample observational techniques, a description of the data collected, and a description of the behavioral measures derived from the data collected, such as alone vs. together activity, and body and eye orientation.

Author (TAB)

**N70-36575#** Naval Medical Research Inst., Bethesda, Md. **BIBLIOGRAPHY ON SAFE HUMAN THRESHOLDS TO EXTRA-LOW-FREQUENCY ELECTRIC CURRENT**

John C. Keesey Mar. 1970 48 p

(AD-705067; NAVMED-MR005.08-0030B-2) Avail: CFSTI CSCL 6/16

Over one thousand references on electric shock hazards and electrical safety are included from three computer retrievals, a sixty-hour Library of Congress search and contributions from over 50 organizations and individuals. The citations are divided into sections according to subject matter and arranged alphabetically by author within each section. Emphasis is upon published original experimental work concerning physiological thresholds to electric current at power transmission frequencies. Experimental work on biological impedances and on the pathophysiology of electric shock is also represented extensively. Clinical reports of pathological sequelae of electric shock are categorized, as are electrical safety standards in industry, agriculture and medicine. A few biological references obtained on peripherally-related subjects such as electroanesthesia, electroconvulsive therapy and legal execution are included. Finally, selected general reviews are presented.

Author (TAB)

**N70-36635#** Department of Labor, Washington, D.C. Bureau of Labor Standards.

**THE INORGANIC ACIDS**

1969 30 p refs revised /ts Bull. No. 265

Avail: SOD \$0.25

Properties and characteristics of the common commercial forms of inorganic acids are presented. Potential hazards of inorganic acid groups are discussed, as well as their control and preventive measures, packaging, handling, storage, labeling, waste disposal, and first aid procedures. Unique characteristics or hazards of individual acids such as chromium trioxide, hydrochloric, hydrogen fluoride, nitric, perchloric, and sulfuric acids are cited. Physical and chemical properties of the inorganic acids and emergency procedures are tabulated.

J.M.

**N70-36764\*#** West Virginia Univ., Morgantown. **THE EFFECT OF CHANGING GRAVITY AND WEIGHTLESSNESS ON VASOPRESSIN CONTROL SYSTEMS** Progress Report, 21 Oct. 1969 - 15 Feb. 1970

Walter H. Moran, Jr. 15 Feb. 1970 7 p refs

(Grant NGR-49-001-019)

(NASA-CR-112358) Avail: CFSTI CSCL 06S

Using the LAP6/WVU system, a comparative study of the immunochemical and antidiuretic biological assays of vasopressin is reported. The first step in the study consisted of calibrating the reference standards. Secondly, calculated amounts of master reference standard were added to fresh plasma prior to extraction; the amounts of added vasopressin were calculated to fall within an easily detectable range. The procedure used and the results for bioassay and immunoassay are given. A semiquantitative comparison was made and is reported. The immunochemical activity matched the biological activity of vasopressin, although a lack of adequate sensitivity of the immunoassay was observed. Immunochemical assay was then experimentally used for the estimation of vasopressin content of rat urine.

P.A.B.

**N70-36775\*#** Pillsbury Mills, Inc., Minneapolis, Minn. **MAXIMUM VARIETY FROM FEEDING UNIT OF LOW WEIGHT AND BULK** Final Report, May 1968 - Sep. 1969

James Blodgett Nov. 1969 74 p refs

(NASA Order R-22-015; Contract DAAG17-68-C-0148)  
(NASA-CR-112676; TR-70-29-FL; FL-103) Avail: CFSTI CSCL 06H

Information is presented for the preparation of 7 improved food bars and 11 improved adjunct cubes which, when combined in defined combinations, yield 32 familiar meal items. Five dual function food bars were also prepared. Dual function bars may be consumed as is or hydrated to yield a familiar food item. Two coatings were prepared which, when applied to the food bars and adjunct cubes, prevent attrition and fragmentation during handling. Meal items prepared from the above coated components which had been stored for four months at 38 degrees C in N2 filled cans were found acceptable when evaluated by a 30-man panel. Hedonic ratings for the prepared meal items before and after storage with data on microbiological and moisture changes during storage and data to indicate coating effectiveness are also given.

Author

**N70-36813\***# Aerospace Medical Research Labs., Wright-Patterson AFB, Ohio.

**WEIGHT, VOLUME, AND CENTER OF MASS OF SEGMENTS OF THE HUMAN BODY**

Charles E. Clauser, John T. McConville (Antioch Coll.), and J. W. Young (Civil Aeromedical Inst.) Aug. 1969 108 p refs  
(NASA Order R-90)

(NASA-CR-112672; AMRL-TR-69-70) Avail: CFSTI CSCL 06P

The study was designed to supplement existing knowledge of the weight, volume, and center of mass of segments of the human body and to permit their more accurate estimation on the living from anthropometric dimensions. Weight, volume, and center of mass of 14 segments of the body were determined on 13 male cadavers. Descriptive statistics are presented of these variables as well as a series of regression equations predicting these parameters from anthropometry. Reports of studies are included of the mid-volume of segments as an approximation of their center of mass, relationships between standing and supine anthropometry, postmortem changes in gross body size, and comparisons between densities of fresh and preserved human tissues.

Author

**N70-36826\***# Oak Ridge National Lab., Tenn. Biology Div.

**NEUROSPORA EXPERIMENT P-1037 Final Report**

Frederick J. de Serres Mar. 1970 24 p refs Sponsored in part by NASA and AEC

(NASA-CR-112355 ORNL-TM-2912) Avail: CFSTI CSCL 06R

Genetic effects of space flight alone in combination with known doses of radiation on Neurospora were investigated during Gemini 11 and Biosatellite 2 missions. On the Biosatellite 2 mission a Sr-85 gamma ray source was used; on the Gemini 11 mission a P-32 beta ray source was used. Comparisons were made between flight and ground-control dose response curves. In the Biosatellite 2 experiment Neurospora conidia were tested while collected on the surface of Millipore filters; in the Gemini 11 experiment they were tested both while collected on the surface of Millipore filters and while in a colloidal suspension of agar. The data from the Biosatellite 2 experiments show that there was no difference between the flight and ground-control survival curves nor between flight and ground-control curves for the overall induction of ad-3 mutations. The data from the Gemini 11 experiments show that the samples were affected in the same way. Data from samples flown in suspension showed higher levels of survival and lower frequencies of mutation induction.

NASA

**N70-36857\***# Stanford Univ., Calif. Dept. of Aeronautics and Astronautics.

**NONLINEAR ANALYSIS OF PRESSURE AND SHOCK**

**WAVES IN BLOOD VESSELS**

Robert L. Rockwell (Ph.D. Thesis) Dec. 1969 122 p refs  
(Grant NGL-05-020-223)

(NASA-CR-112864; SUDAAR-394) Avail: CFSTI CSCL 06C

A nonlinear analysis of large amplitude pressure waves was made for a theoretical model of the canine aorta and its continuation beyond the saphenous artery. In particular the changes in the pressure and flow pulses produced by the heart were assessed for meaningful variations in the system parameters. To allow for the interpretation of relatively small changes in the pressure and flow patterns it was considered necessary to take nonlinearities into account as accurately as possible. According to recent experimental evidence, the propagation of the natural pressure pulse should be strongly affected by nonlinear phenomena such as the wave speed variations with pressure and flow and the large local changes in cross-sectional area with pressure. Pressure and flow pulses induced in the aorta and other large arteries were predicted by prescribing the ejection pattern of the heart and the physical and geometric features of the system. The effects of branches and bifurcations were modeled by a continuous outflow pattern which varies with location and pressure. The basic geometry was defined by an exponential decrease of the cross-sectional area of the artery with distance from the heart.

Author

**N70-36861\***# Department of Civil Aviation, Melbourne (Australia). Aviation Medicine Branch.

**THE PRESENTATION OF PRINTED INFORMATION TO AIRCRAFT PILOTS**

R. D. Watkins (Melbourne Univ.) Apr. 1970 38 p refs  
(AM-Memo-27) Avail: CFSTI

The charts and printed material which are carried by pilots are listed in some detail, and the Australian and ICAO control and influence on the format and information content of these documents is described. Factors which affect the legibility of charts and printed material are discussed, and some recommendations are made. The legibility of instruments and the effect of the level of cockpit lighting on legibility are reviewed.

Author

**N70-36933\***# TRW, Inc., Cleveland, Ohio. Mechanical Products Div.

**AIRCREW OXYGEN SYSTEM DEVELOPMENT  
MAN-IN-THE-LOOP TEST REPORT**

R. J. Kiraly, A. D. Babinsky, and J. D. Powell Jul. 1970 60 p  
(Contract NAS2-4444)

(NASA-CR-73395; TRW-ER-7256-22) Avail: CFSTI CSCL 06K

Four members of the NAOS project team volunteered as test subjects for the manned testing of the flight breadboard system. Two series of tests were conducted. During the first test series each of the test subjects using aviation oxygen masks, breathed gases generated and processed by the flight breadboard system. During these tests the system was operated with and without safety pressure. When safety pressure was not used and the counter lung vented to atmosphere, the mask pressures varied between + or - 1 inch of water with respect to ambient pressure. When the counter lung was pressurized with the air pressure control regulator, resulting in a safety pressure in the rebreather loop, the extremes in mask pressure varied between atmospheric pressure and 4 inches of water above atmospheric pressure. Breathing on the system without safety pressure was found to be quite comfortable. When safety pressure was used, the requirement of making a conscious effort to exhale was found to be uncomfortable. Physiological examinations of the test subjects' respiratory system were conducted prior to and after the manned test with the oxygen system. No detrimental effects due to breathing on the system were observed in any of the test subjects' respiration characteristics.

Author



**N70-36936#** Hudock and Hudock, Arlington, Va.  
**THE OPERATIONAL PROFILE AND MISSION OF THE  
 CERTIFIED NON-INSTRUMENT RATED COMMERCIAL  
 PILOT Final Report**

Philip F. Hudock and Robert P. Hudock Jul. 1970 96 p refs  
 (Contract DOT-FA69-WA-2181)  
 (FAA-RD-70-50) Avail: CFSTI

Based on the results of a nationwide, statistically reliable survey, pilots are divided into two major operational flight profiles: the medium operation and the complex operation; and one minor profile: the military operation. Profiles are defined on a functional basis. The medium profile pilots perform primarily personal (non-commercial) flights. The complex profile pilots are primarily engaged in commercial (for-hire) flights. The complex profile is composed of three sub-profiles: (1) transportation of persons and property for hire, (2) flight instruction given, and (3) aerial application and survey. The aeronautical skills and knowledge necessary for the safe operation of the missions of each group are identified. Training and testing to a level of operational competence is suggested with separate programs for the medium and complex profiles.

Author

**N70-36956#** Lockheed Missiles and Space Co., Palo Alto, Calif.  
**INFLUENCE OF OPTOKINETIC AND VESTIBULAR EFFECTS  
 ON THE MAN-OPERATOR RELIABILITY IN CONTROL  
 SYSTEMS OF FLYING VEHICLES**

Iv. I. Kirilenko et al 1970 5 p refs Transl. into ENGLISH from Kosmich. Issled. (Moscow), v. 8, no. 3, 1970 p 476-478  
 Avail: National Translations Center, John Crerar Library, Chicago, Ill. 60616

Effects of vestibular stimulation (control mode), combined vestibular and optical kinetic stimulation (summation mode), and of out-of-phase stimulation (interference mode) were correlated to work capacity reduction and reliability characteristics of human operators in the control systems of flying vehicles. Prolonged stimulation of vestibular and optical analyzers established that the distribution law capacity of the operator work-capacity was subjected to a truncated normal law. Operator reliability in the stimulant summation mode was considerably less than in either the control or interference modes. Optokinetic and vestibular effects affected tracking quality; recovery of work capacity after summation mode stimulation proceeded much slower than in either of both the single stimulation modes.

G.G.

**N70-36993#** Commissariat a l'Energie Atomique,  
 Fontenay-aux-Roses (France). Centre d'Etudes Nucleaires.  
**THE ASSESSMENT OF BONE MARROW INTERNAL  
 EXPOSURE TO STRONTIUM 90 AS A FUNCTION OF  
 AGE [EVALUATION DE L'IRRADIATION DE LA MOELLE  
 OSSEUSE EN FONCTION DE L'AGE APRES  
 CONTAMINATION PAR LE STRONTIUM 90]**

Monique Odievre and David Mechali Feb. 1970 34 p refs  
 In FRENCH; ENGLISH summary  
 (CEA-R-3952) Avail: CFSTI

Bone marrow exposure is considered as being representative of the hazards following contamination by Sr-90. The general method of assessing the exposure and the evolution of the values of the different parameters used as functions of age are described. Exposure following ingestion and via the respiratory route were studied successively. In each case continuous and short-time exposures were used. In the former the time evolution of dose rates as a function of the age at the beginning of the exposure were measured while in the latter it was analyzed as a function of the doses used.

Author (ESRO)

**N70-36998#** Commissariat a l'Energie Atomique, Grenoble  
 (France). Centre d'Etudes Nucleaires.

**ELECTRON SPIN RESONANCE STUDY OF FREE RADICALS  
 CREATED BY RADIATIONS IN SOME ORGANIC  
 SUBSTANCES: APPLICATION TO DOSIMETRY  
 MEASUREMENT OF FREE RADICALS PRODUCED IN**

**ALANINE [ETUDE PAR RPE DES RADICAUX LIBRES CREEES  
 SOUS IRRADIATION DANS CERTAINES SUBSTANCES  
 ORGANIQUES: APPLICATION EN DOSIMETRIE DE LA  
 MESURE DES RADICAUX LIBRES CREEES DANS L'ALANINE]**

Solange Descours, Jacques Assayrenc, Francis Bermann, Bernard Couderc, Henri de Choudens et al May 1970 47 p refs In FRENCH; ENGLISH summary  
 (CEA-R-3913) Avail: CFSTI

This report completes the results obtained with free radicals created in glycine. The nature and number of these radicals produced by irradiation in cysteine and glutathione were investigated, and free radicals generated in alanine were specially studied. A linear law holds over a large dose range between the number of radicals created and the absorbed dose and this property along with the high stability of the radicals makes this amino acid of use in the dosimetry field. With 1 g alanine powder, it was possible to make gamma ray measurements between 5 and 5 million rads. The radical yield was lower for neutrons than for gamma rays. A larger yield was obtained by adding paraffin and it was possible to make compact dosimeters which were easier to use than alanine powder ones. Addition of a higher Z constituent e.g. Ca, Ba, might improve the yield of the dosimeter for gamma rays with energy less than 70 keV.

Author (ESRO)

**N70-37005#** Joint Publications Research Service, Washington,  
 D.C.

**GROWTH OF SPACE MEDICINE, BIOLOGY HIGHLIGHTED**

In its Soviet Studies on Space Topics 6 Aug. 1970 p 6-16  
 (See N70-37001 20-30)

Avail: CFSTI

A brief review of the development of aerospace medicine is given. Life support systems, circadian rhythms, space flight food, and physiological responses to flight stress are considered, and biological experiments are mentioned.

N.E.N.

**N70-37015#** Commissariat a l'Energie Atomique, Grenoble  
 (France). Centres d'Etudes Nucleaires.

**DETECTION OF RARE-EARTHS IN PLANTS USING  
 RADIOACTIVATION METHODS: APPLICATION OF THE  
 METHOD IN GEOCHEMICAL ECOLOGY [LA RECHERCHE  
 DES TERRES RARES DANS LES VEGETAUX AU MOYEN  
 DE L'ANALYSE PAR RADIOACTIVATION: POSSIBILITES  
 DE LA METHODE EN ECOLOGIE GEOCHIMIQUE]**

Robert Danne and Andre Fourcy Jan. 1970 25 p refs In FRENCH; ENGLISH summary  
 (CEA-R-3917) Avail: CFSTI

A method for the quantitative analysis of the rare earth elements in plant material was designed. Ashed plant material was irradiated for 96 hours by a 2 x 10 to the 13th power neutrons/(sq cm)(sec) thermal flux in a swimming pool type reactor. The rare earth group was isolated by precipitation with liquid ammonia and radiochemically purified by a first sequential chromatography on a cationic resin. Rare earth elements were separated from one another by a second chromatography on a cationic resin according to the alpha-hydroxyisobutyric acid process. The different elements were analysed by gamma spectrometry by comparison with an identically activated standard. The method permits accurate analysis of 11 lanthanides, some of which exist in amounts lower than the ppm range. Walnut leaves (*Juglans nigra*) and aerial organs of



Cladium mariscus and the corresponding peaty soil were analysed. The absolute levels of the rare earth elements differed between samples but their relative distributions were almost the same.

Author (ESRO)

**N70-37029\***# Stanford Univ., Calif. Dept. of Aeronautics and Astronautics.

**EXPERIMENTAL STUDIES OF THE VARIATIONS IN THE MECHANICAL PROPERTIES OF THE CANINE ABDOMINAL VENA CAVA**

William G. Yates (Ph.D. Thesis) Nov. 1969 118 p refs (Grant NGR-05-020-223)

(NASA-CR-112876; SUDAAR-393) Avail: CFSTI CSCL 06C

A study was conducted to acquire quantitative data which will aid the development of a mathematical model for the mechanical behavior of large veins, including the associated control mechanisms. A method for determining the speed and attenuation of artificially induced pressure waves propagating in the abdominal vena cava of anesthetized dogs is described. Short trains of small-amplitude, sinusoidal pressure waves are generated by a vibrating piston placed in the left common iliac vein. The volumetric displacements generated by the piston movement create small pressure waves which propagate into the vena cava. The amplitude and frequency of the piston movement can be accurately controlled. Two catheter-tip manometers, which are placed a few centimeters apart in the segment of abdominal vena cava between the bifurcation and the renal branches, detect the propagating pressure waves; the outputs from the manometers are amplified and recorded on a high-speed oscillograph. The wave speed is calculated by dividing the distance between the catheter-tip manometers by the time required for a particular wave to travel from one manometer to the other. The attenuation is obtained by comparing the wave amplitudes recorded by the two transducers.

Author

**N70-37047#** Sheffield Univ. (England).

**INTESTINAL ABSORPTION INFORMATION CENTRE Progress Report, Sep. 1966 - Mar. 1968**

[1969] 25 p

(OSTI-5027) Avail: CFSTI

The report describes the development of an intestinal absorption information service. A case history of the project is presented and an investigation of computer-based current awareness services (ASCA, MEDLARS, CBAC, and CT) is described. A list of projects for future investigation is also given.

ESRO

**N70-37063#** Joint Publications Research Service, Washington, D.C.

**EFFECTS OF STRESS AND OTHER CONDITIONS ON HIGHER NERVOUS ACTIVITY**

I. S. Dobronravova et al 31 Jul. 1970 11 p refs Transl. into ENGLISH from Zh. Vysshei Nervnoi Deyatel'nosti (Moscow), v. 20, no. 3, May-Jun. 1970 p 647-649 and 655-657

(JPRS-51067) Avail: CFSTI

**CONTENTS:**

1. CHANGES IN SOME ELECTROPHYSIOLOGICAL PARAMETERS AFTER DISTURBANCE OF A RHYTHMIC SYSTEM OF MOTOR-CONDITIONED REACTIONS IN MAN I. S. Dobronravova p 1-4 refs (See N70-37064 20-04)

2. RHEOENCEPHALOGRAPHY AS AN INTEGRAL METHOD OF REGISTRATION OF PSYCHIC STRESS V. N. Pushkin et al p 5-9 refs (See N70-37065 20-04)

**N70-37064#** Joint Publications Research Service, Washington, D.C.

**CHANGES IN SOME ELECTROPHYSIOLOGICAL PARAMETERS AFTER DISTURBANCE OF A RHYTHMIC SYSTEM OF MOTOR-CONDITIONED REACTIONS IN MAN**

I. S. Dobronravova *In its Effects of Stress and Other Conditions on Higher Nervous Activity* 31 Jul. 1970 p 1-4 refs (See N70-37063 20-04)

Avail: CFSTI

Investigated are changes in EEG and EMG in humans following disturbance of the stability of the rhythmic system of motor conditioned reactions. A clear dependence of the degree of disturbance on the moment in the time interval between rhythmic subsequent conditioned stimuli at which the unexpected signal was presented, was established. Obtained data indicate that larger disturbances of the system require prolonged generalized excitation of the central nervous system which involves the non-specific structure and its higher level.

G.G.

**N70-37065#** Joint Publications Research Service, Washington, D.C.

**RHEOENCEPHALOGRAPHY AS AN INTEGRAL METHOD OF REGISTRATION OF PSYCHIC STRESS**

V. N. Pushkin et al *In its Effects of Stress and Other Conditions on Higher Nervous Activity* 31 Jul. 1970 p 5-9 refs (See N70-37063 20-04)

Avail: CFSTI

The use of REG in the clinic provided accurate information about the intensity the cerebral vessels and their pathological changes. The clinical data obtained justify the assumption that REG may be used as a method of registering psychic stress. Such a possibility is confirmed by investigations of the cerebral blood circulation and of mental fatigue. Even brief intense psychic activity causes such changes in the cerebral blood circulation that it is expressed in the parameters of the rheoencephalogram.

Author

**N70-37074#** Commissariat a l'Energie Atomique, Fontenay-aux-Roses (France). Centre d'Etudes Nucleaires.

**A STUDY OF THE INTERNAL CONTAMINATION LEVELS RESULTING FROM Sr-90 and Cs-137 ENVIRONMENTAL POLLUTION: INFLUENCE OF DIFFERENT FACTORS [ETUDE DES NIVEAUX DE CONTAMINATION INTERNE RESULTANT D'UNE POLLUTION DE L'ENVIRONNEMENT PAR LE Sr-90 ET Cs-137: INFLUENCE DES DIFFERENTS PARAMETRES]**

Arlette Garnier Feb. 1970 105 p refs In FRENCH; ENGLISH summary

(Contract EURATOM-003-63-10-PSAF)

(CEA-R-3861; EUR-4146-f) Avail: CFSTI

The amounts of Sr-90 and Cs-137 dietary intakes as a function of age were evaluated with a view to assessing internal exposure doses and estimating the critical age, and also to study the relative significance of the several factors involved. The data were derived from dietary surveys made in eleven European areas from which the evolution of the consumed amounts of thirteen groups of foodstuffs, as a function of age, was derived and the mean parameters of contamination transfer were deduced. The variability of some of these parameters was very large and an attempt was made to assess their effect on the total contamination. An attempt was also made to assess doses as a function of age in the case of protracted exposure using the above results and radiobiological factors derived from the literature.

Author (ESRO)

**N70-37076\***# National Aeronautics and Space Administration, Marshall Space Flight Center, Huntsville, Ala.

**STRESS EFFECTS OF HIGH NOISE LEVELS ON LOWER**

**BODY NEGATIVE PRESSURE EXPERIMENTS**

R. E. Allen, R. L. Trobaugh, and B. B. Henson Washington Sep. 1970 49 p refs  
(Contract 931-31-19-00-62)  
(NASA-TN-D-5967) Avail: CFSTI CSCL 06S

The purpose of the study was to examine the effects of high noise levels on subjects experiencing lower body negative pressure. The subjects participating in the study were five males ranging from 24 to 33 years, and all were in good physical condition. Each subject was required to have hearing sensitivity within normal limits and to have had no excessive exposure to noise prior to testing. Each subject was given a complete audiological examination to determine his hearing level prior to testing. Noise levels of varying intensities were introduced through earphones to the subject while he was in the lower body negative pressure device (LBNDP). Physiological data were collected prior to the experiment to establish each subject's baseline response. The noise experiment lasted 30 minutes, and each subject experienced 4 bursts of 100 dB pink noise for a duration of 1.5 minutes each. A negative pressure of -40 mmHg was maintained for 12.5 minutes. The physiological parameters measured on each subject were EKG, blood pressure, GSR, respiratory rate, respiratory volume, lower body temperature, and upper body temperature. Ambient conditions in the laboratory were also monitored, and the testing was recorded on a tape recorder for the purpose of recall. The results indicated that 100 dB of noise given at random time intervals throughout the lower body negative pressure test produced no significant recurring effects on heart rate or blood pressure that could be credited to the noise stimulus. The introduction of noise did affect the GSR, indicating that high noise levels do produce some stress on subjects in the LBNDP. Author

**N70-37080#** Commissariat a l'Energie Atomique, Fontenay-aux-Roses (France). Centre d'Etudes Nucleaires.  
**THE STUDY OF THE STABILITY, AFTER GAMMA-IRRADIATION, OF A FEW NEWLY PREPARED ORGANIC MOLECULES [ETUDE DE LA STABILITE, APRES IRRADIATION GAMMA, DE QUELQUES MOLECULES ORGANIQUES NOUVELLES]**

Charles Megemont, Claude Felix, and Michel Sy Apr. 1970 23 p refs In FRENCH; ENGLISH summary  
(CEA-R-3962) Avail: CFSTI

Radioactivity measurements led to the examination of the stability of twelve new organic molecules after irradiation with increasing fluxes of gamma-rays. This work includes a short review of papers on the main properties of uracil and thiouracil compounds, a description of experimental conditions and interpretations of the infrared spectra of the new compounds. Author (ESRO)

**N70-37111#** Commissariat a l'Energie Atomique, Marcoule (France). Centre de Production de Plutonium.  
**USE OF EXTRA-RENAL PURIFICATION METHODS IN THE TREATMENT OF TRITIATED WATER CONTAMINATION [UTILISATION DES METHODES D'EPURATION EXTRARENAL DANS LE TRAITEMENT DE LA CONTAMINATION PAR L'EAU TRITIEE]**

Jacques Mirouze (Clin. Saint-Eloi, Montpellier), Charles Mion (Clin. Saint-Eloi, Montpellier), Jean-Luc Fabre (Clin. Saint-Eloi, Montpellier), Edmond Mazaury, Philippe Henry et al May 1970 87 p refs In FRENCH; ENGLISH summary  
(CEA-R-3974) Avail: CFSTI

After giving a brief description of the biological and radiotoxicological properties of tritium, methods of treating contamination by tritiated water and in particular extra-renal

purification methods are discussed. A method for interpreting peritoneal dialysis and a study of six cases which makes it possible to envisage a biological treatment period of about thirteen hours for a normal man are described. Haemodialysis should reduce this period to under four hours. A method which takes into account the degree of contamination is also discussed. Author (ESRO)

**N70-37113#** Commissariat a l'Energie Atomique, Fontenay-aux-Roses (France). Centre d'Etudes Nucleaires.  
**DOSE ABSORBED IN BIOLOGICAL TISSUE IRRADIATED BY FAST MONO-ENERGETIC NEUTRONS [DOSE ABSORBEE DANS UN TISSU BIOLOGIQUE IRRADIE EN NEUTRONS RAPIDES MONOENERGETIQUES]**

Helene Sklavinitis and Christian Devillers Apr. 1970 39 p refs In FRENCH; ENGLISH summary  
(CEA-R-3994) Avail: CFSTI

This report describes the calculation of the energy deposition and the dose absorbed in an irradiated biological tissue equivalent medium, and relates to radioactivation quantitative analysis by means of wide beams of fast monoenergetic and unidirectional neutrons. The results are compared to similar data obtained with energies of 10, 2, and 0.5 MeV. The method is then applied to neutron energies of 14.75 and 3.6 MeV. Author (ESRO)

**N70-37128#** Atomic Energy Commission, Las Vegas, Nev. Operations Office.

**NATURAL ENVIRONMENTAL RADIOACTIVITY: AN ANNOTATED BIBLIOGRAPHY**

Alfred W. Klement, Jr. Apr. 1970 72 p refs  
(WASH-1061-Suppl) Avail: CFSTI

A bibliography on natural environmental radioactivity is presented which contains more than 1000 references. The material is divided into six categories: general, atmosphere, biological materials, soils, general waters, and groundwater with each category alphabetized by author. NSA

**N70-37137#** Commissariat a l'Energie Atomique, Cadarache (France). Centre d'Etudes Nucleaires.

**MATHEMATICAL PROCESSING OF SCINTIGRAPHIC IMAGES [TRAITEMENT MATHEMATIQUE DES IMAGES SCINTIGRAPHIQUES]**

Henri Ottavi Dec. 1969 35 p refs In FRENCH; ENGLISH summary  
(CEA-R-3920) Avail: CFSTI

A scintigraphic image always lacks sharpness, whether it be obtained using a stenopaic cine-camera, a collimating grid, or by scanning. If the object is planar, the image can be deduced from the object by a linear transformation and a method for the inversion of this transformation, which takes into account random changes in the image, is presented. From this is deduced the order of magnitude of the sharpness which one can hope to obtain from a mathematical processing of the image, taking into account the three parameters: object activity, exposure time, object distance. Author (ESRO)

**N70-37139#** Commissariat a l'Energie Atomique, Cadarache (France). Centre d'Etudes Nucleaires.

**BIBLIOGRAPHICAL REPORT: WHOLESOMENESS STUDIES RELATIVE TO IRRADIATED STARCHY FOOD AND SUGARS [RAPPORT BIBLIOGRAPHIQUE: LES ETUDES D'INNOCUITE RELATIVES AUX ALIMENTS AMYLAQUES ET AUX SUCRES IRRADIES]**

Gerard Berger Mar. 1970 36 p refs In FRENCH; ENGLISH summary  
(CEA-BIB-178) Avail: CFSTI

This report analyzes some 110 articles published since 1955 on wholesomeness trials of irradiated starchy food and sugars. Synthetic diets containing irradiated starch were tested on higher animals and they generally ensure a normal species growth. The growth of *Aspergillus Orizae* was not reduced by 3 Mrad doses of irradiated starch. Work on higher animals with potatoes, corn, maize and diets containing glucose or starch which had been treated with pasteurizing or sterilizing doses greater than 200 krad and nutrition experiments on man are discussed. Toxicity studies on irradiated sugars using microorganisms or tissue cultures are reviewed. Trials with caffeine and alcohol and experiments on insects are treated. Author (ESRO)

**N70-37216#** Department of Labor, Washington, D.C. Bureau of Labor Standards.

**THE FUNDAMENTALS OF ACCIDENT PREVENTION**

1969 17 p refs Revised *Its* Bull. No. 247  
Avail: SOD \$0.15

Basic elements in industrial safety programs are outlined. Establishment of policy, delegation of authority, and assessing the progress made are discussed under management leadership. The layout of the workplace, working surfaces, tools and equipment, machine safeguarding, and materials-handling facilities are cited, as well as flammable materials, housekeeping, health hazards, and maintenance. The need for proper training and supervision is stressed. Methods for maintaining employee participation and interest in the safety committees and activities are mentioned. J.M.

**N70-37224#** Oxford Univ. (England). Dept. of Engineering Science.

**A STUDY INTO THE AVAILABILITY OF CONTROL SITES FOR THE ACTUATION OF POWERED UPPER LIMB PROSTHESES FOR THE CONGENITAL LIMB DEFICIENT CHILD Final Report**

E. E. Rogers Mar. 1970 25 p refs Sponsored by Dept. of Health and Social Security  
(FR-1103/70) Avail: CFSTI

The following aspects of the work on the availability of control sites for the actuation of powered upper limb prostheses for children with congenital limb deformities (Rept-1086-69) are considered: (a) a review of 18 children in their acceptance and rejection of upper limb appliances; (b) a clinical evaluation of the Edinburgh model powered upper limb prosthesis. Author (ESRO)

**N70-37279#** Joint Publications Research Service, Washington, D.C.

**CHEMICAL CONTINUUM OF BRAIN AS A MECHANISM OF REFLECTION OF REALITY**

P. K. Anokhin 14 Aug. 1970 17 p refs Transl. into ENGLISH from *Vopr. Filosofii* (Moscow), no. 6, 1970 p 107-118

(JPRS-51176) Avail: CFSTI

Based on the theory of reflection, it is suggested that the fundamental law of the inorganic world, the space-time continuum, determines all forms of behavior of life from the primitive forms to man. The appearance of life on earth means that all macroprocesses occurring over long time intervals are reflected in the microworld of molecular reactions of living matter. Conditions for leaping ahead into the future were produced, and adaptatory behavior appeared in the highest degree. Author

**N70-37320#** Bureau of Radiological Health, Rockville, Md. Div. of Biological Effects.

**RADIATION BIO-EFFECTS Summary Report, Jan.-Dec. 1969**

William A. Mills and Donald M. Hodge, ed. 1970 240 p refs  
(PB-190110; DBE-70-1) Avail: CFSTI CSCL 6/18

This report summarizes the activities of the Division of Biological Effects during 1969. The investigations of Epidemiologic Studies Branch and the Experimental Studies Branch which comprise the division are discussed. Titles of papers that division investigators have prepared for presentation and those appearing in print during the year are listed. Author (USGRDR)

**N70-37333#** Interior Dept., Washington, D.C. Office of Library Services.

**MERCURY CONTAMINATION IN THE NATURAL ENVIRONMENT: A COOPERATIVE BIBLIOGRAPHY**

Jul. 1970 40 p refs

Avail: CFSTI

Environmental contamination by mercury is a current concern of many bureaus and offices of the U.S. Department of the Interior. The purpose of this bibliography is to provide access to the literature related to this subject. Publications providing background and current information have been selected from the large body of literature on mercury. English language material relating to fish, wildlife and water pollution has been given full coverage from the sources consulted. Author

**N70-37340#** Public Health Service, Las Vegas, Nev. Southwestern Radiological Health Lab.

**PARTICULATE EFFLUENT STUDY, PHOEBUS 1B, EP-4**

Apr. 1970 53 p refs

(AEC Order SF-54-373; Proj. Rover)

(SWRHL-46-r) Avail: CFSTI

The reactor test was part of the Project Rover Program. Particles were found out to 82 miles from the test cell with the results indicating a decrease in deposition (particles/unit area) with distance to about the 2.5 power. The particle size distribution, of all the particles collected, is reasonably described by a log normal distribution with a geometric mean diameter of about 12 microns and a geometric standard deviation of 2.7. A regression analysis indicated a decrease in particle size and activity with distance. Isotopic results showed a large degree of fractionation of the fission products found in the particles. Electron microprobe analysis indicated uranium, carbon, and oxygen to be present in most of the particles analyzed. Particles were transported into the off-site area. The resulting ground concentrations were about 1 particle/100 sq m or less and there was no known interaction of particles with people from the general population. It is concluded there was no hazard to the public from the particulate effluent. Author (NSA)

**N70-37398\*#** Wisconsin Univ., Madison. Dept. of Horticulture. **ENDOGENOUS SHORT PERIOD RHYTHMS IN THE MOVEMENTS OF UNIFOLIATE LEAVES OF PHASEOLUS ANGULARIS WIGHT**

D. K. Alford and T. W. Tibbitts 30 May 1970 16 p refs  
(Grant NGR-50-002-109)

(NASA-CR-112848) Avail: CFSTI CSCL 06C

Rhythmic rotational movements with the midvein as the axis were observed in the unifoliate leaves of *Phaseolus angularis* Wight grown under controlled environmental conditions with continuous light. The mean period of this movement for all leaves was 53.2 min. + or - 4.3 min. and remained constant as the leaf matured, except after removal of the apical meristem and

## N70-37403

emerging trifoliate leaf when the period increased about 5 min. The amplitude of the movement also remained constant as the leaf matured. The rotational movements were pronounced when the leaf blade was in a horizontal position and were not evident during the downward or sleep movements of the leaf. This movement began 3 days after leaf unfolding and continued for at least 6 days. It was most pronounced at the time of inflection of the leaf length growth curve after the logarithmic phase of growth. Author

N70-37403\*# Stanford Univ., Calif. Instrumentation Research Lab.

### CYTOCHEMICAL STUDIES OF PLANETARY MICROORGANISMS: EXPLORATIONS IN EXO BIOLOGY

Summary Report, 1 Jul. 1969 - 1 Jul. 1970

Joshua Lederberg 1 Jul. 1970 41 p  
(Grant NGR-05-020-004; Contracts NIH 69-2064; F44620-67-C-0070; Grants NIH GM-17367; NIH AM-12797 et al) (NASA-CR-112847; SU-IRL-1110) Avail: CFSTI CSCL 06M

Progress is reported on the determination of optical activity by gas liquid chromatography, gas chromatography of amino acids, the reaction of chlorine with DNA, analysis of lunar samples from Apollo 11 and 12 for carbon compounds and porphyrin-like pigments, mass spectrometry of 1-phenylethyl carbamates, analysis of natural products by mass spectrometer, the use of artificial intelligence in the solution of problems in analytical organic chemistry, research in computer instrumentation of laboratory instruments, cell separation, a high speed fluorescent cell sorter, optical data processing, a quasi-microscope for the Viking Mars Lander, and Mariner Mars 1971 Orbiter photography. R.B.

N70-37428# Oak Ridge National Lab., Tenn.

### PROCEEDINGS OF CONFERENCE ON INHALATION CARCINOGENESIS

Apr. 1970 524 p refs Held at Gatlinburg, Tenn., 8-11 Oct. 1969 Sponsored in part by AEC Prepared in cooperation with Natl. Cancer Inst. /ts AEC Symp. Ser. 18 (CONF-691001) Avail: CFSTI

Twenty-five symposium papers are presented under the following headings: current studies in inhalation carcinogenesis, respiratory carcinogenesis, cellular and functional injury following inhalation exposure, inhalation technology, and relation of inhalation exposure to carcinogenesis. E.C.

N70-37433# Sacramento Regional Area Planning Commission, Calif.

### THE AIR POLLUTION THREAT

Larry Faith Oct. 1969 76 p refs Supported in part by HUD (PB-191382) Avail: CFSTI CSCL 13B

Contents: General inventory of air pollution sources and emissions; A summary of federal, state, and local air pollution laws; The quality of air in the sacramento regional area; Projections of population, vehicles, and activities to 1990; Air quality in the Sacramento Region in 1990; Suggested air quality goals - Short term and long term; Alternative governmental organizations to deal with air pollution; A suggested program for the Sacramento Region; Budget requirements for a six county regional air quality control district; Citizen attitudes on air quality. USGRDR

N70-37435# Argonne National Lab., Ill.

### RADIOLOGICAL PHYSICS DIVISION Annual Report, Jul. 1968 - Jun. 1969

Jun. 1969 233 p refs

(Contract W-31-109-eng-38)

(ANL-7615) Avail: CFSTI

Research concerning toxicity of radioelements is reported, including separation of cesium and rubidium by the ferrocyanides of copper, zinc, and zirconium; application of cellulose nitrate films for alpha autoradiography of bone; regularization unfolding in low gamma ray activity measurements for one dimensional scanning and for two dimensions; retention of Ba-133 in beagles; and natural thorium in human bone. Meteorological research includes Chicago air pollution system model experimental studies and case studies; the use of pyrheiliometers for continuous measurements of an effective air pollution mixing depth; and a tabulation technique for forecasting concentrations of urban air pollutants. Radiation physics studies concern fluorescence polarization; electro-optical techniques for ultrasensitive radiophotoluminescent dosimetry; permanent damage of Li(7)F thermoluminescent dosimeters by fast neutrons; specific primary ionization; and the effect of pressure upon ionization in pure rare gases. In the field of bio-environmental studies, the behavior of fallout Cs-137 in aquatic and terrestrial environments was studied. P.A.B.

N70-37461\*# National Aeronautics and Space Administration, Marshall Space Flight Center, Huntsville, Ala.

### STERILIZATION OF UNMANNED PLANETARY SPACECRAFT, A REPORT ON CURRENT TECHNOLOGY

F. J. Beyerle and E. B. Snow 12 Sep. 1970 52 p refs (NASA-TM-X-53884; MSFC-R-ME-IN-67-5) Avail: CFSTI CSCL 06M

The overall philosophy of spacecraft sterilization is discussed, and the present state of the art of NASA policy is presented. Biological considerations necessary for the implementation of a planetary quarantine policy are outlined, and facilities and sterilization methods are discussed. The sterilization considerations required at each stage in the planning of a mission are discussed, and the present status of technological development in each phase of mission programming is presented, with special emphasis on problem areas and those which need further definition. Author

N70-37467\*# Texas Christain Univ., Fort Worth. Dept. of Psychology.

### DISTANCE AND RATE JUDGMENTS IN SIMULATED SPACE Final Report, 1 Sep. 1967 - 30 Nov. 1969

Malcolm D. Arnoult and Robert P. Markley 30 Nov. 1969 5 p (Grant NGR-44-009-018) (NASA-CR-112843) Avail: CFSTI CSCL 05E

A description is presented of a space visual simulator for producing continuously variable images of a scale model target by reflecting light from the target through a set of five lenses. A unique feature of the apparatus is that the simulated distance is achieved by having the apparent source of the light rays appropriate to the distance being represented, and by having an image which is actually three-dimensional. Studies of distance judgment were conducted using both verbal and nonverbal response measures. D.L.G.

N70-37468\*# Michigan Univ., Ann Arbor. Inst. of Science and Technology.

### INSTITUTE OF SCIENCE AND TECHNOLOGY Progress Report, 15 Apr. 1969 - 15 Apr. 1970

Ward Edwards 20 Apr. 1970 25 p (Grant NGL-23-005-171) (NASA-CR-112842; PR-3) Avail: CFSTI CSCL 05E

Experiments are discussed involving the application of multi-level inference systems to aerospace engineering. The human

factors role in man machine systems for information processing is of prime concern in these experiments, and specific areas of interest include: (1) the role of computer displays and controls in probabilistic information processing; (2) misaggregation vs. misperception; (3) group vs. individual performance in inference and decision making; and (4) multiattribute utilities as tools for selection, scheduling, and rescheduling of experiments for manned space flights.  
D.L.G.

**N70-37471\*#** Scientific Translation Service, Santa Barbara, Calif.  
**ENZYMATIC PROCESSES ON MEMBRANE MODELS**  
**[FREMENTATIVNYE PROTSESSY NA MODELNYKH**  
**MEMBRANAKH]**

G. A. Deborin Washington NASA Sep. 1970 10 p refs Transl. into ENGLISH from the book 'Abiogenez i Nachalnyye Stadii Evolyutsii Zhizni' Moscow, Nauka Press, 1968 p 63-68 (Contract NASw-2035)  
(NASA-TT-F-13185) Avail: CFSTI CSCL 06A

The results of a study of enzymatic activity in an experimental setup with a lipid membrane separating the enzyme (ribonuclease) from the substrate (RNA) are given. The migration of the enzyme through the membrane to the RNA is investigated. Considerations are given concerning the role of membranes in controlling the enzymatic activity in the biological cell.  
Author

**N70-37473\*#** Scientific Translation Service, Santa Barbara, Calif.  
**THE EARLIEST FORMS OF LIFE IN NORTHERN EURASIA**  
A. G. Vologdin Washington NASA Sep. 1970 9 p Transl. into ENGLISH from the Russian  
(Contract NASw-2035)  
(NASA-TT-F-13189) Avail: CFSTI CSCL 06C

Application of the paleontological method of studying sedimentary deposits to an investigation of the earliest forms of life is discussed. A study of cross sections of many rock formations in the USSR, Mongolia, China, Czechoslovakia, and Poland resulted in the observation and partial recording of vestiges of a number of groups of organisms which clearly belong to various stages of the development of life during Precambrian times. The data collected supplement the small amount of data available in foreign countries on vestiges of organisms by citing a large number of new species of blue-green algae. Vestiges of simple life forms such as jellyfish and sponges were also discovered. The earliest forms of organisms on the territory of the USSR were established as being about 2.6 billion years old which definitely cannot be considered as the time of origin of life.  
Author

**N70-37490\*#** Scientific Translation Service, Santa Barbara, Calif.  
**CARBOHYDRATE METABOLISM IN INVERTEBRATES:**  
**TRENDS IN ITS EVOLUTION**  
F. F. Soprunov Washington NASA Sep. 1970 14 p refs Transl. into ENGLISH from the Russian  
(Contract NASw-2035)  
(NASA-TT-F-13190) Avail: CFSTI CSCL 06B

Experiments were conducted to determine the carbohydrate metabolism and tissue respiration in deep water holothurians. The ferricyanidreductase activity of the homogenate incubated at 750 atm pressure was compared with the ferricyanidreductase activity for incubation in the same medium, but at atmospheric pressure. It is concluded that the transfer from the original fermentative processes to aerobic metabolism proceeded step by step. Author

**N70-37500\*#** National Aeronautics and Space Administration, Marshall Space Flight Center, Huntsville, Ala.  
**EFFECT OF CURRENT CLEANING PROCEDURES ON**

**STERILIZATION OF SPACECRAFT COMPONENTS**

12 Sep. 1969 16 p refs  
(NASA-TM-X-53885) Avail: CFSTI CSCL 06M

The effect of cleaning procedures on sterilization of spacecraft components is discussed. Spacecraft components consisting of aluminum panels and stainless steel tubes were cleaned using the nonviable procedures. The cleaning process significantly reduced the biological load on the test specimens but did not sterilize the spacecraft components.  
Author

**N70-37502\*#** Scientific Translation Service, Santa Barbara, Calif.  
**ULTRAVIOLET RAYS AND ONE-CELLED ORGANISMS**  
M. M. Kamshilov Washington NASA Sep. 1970 6 p refs Transl. into ENGLISH from the Russian  
(Contract NASw-2035)  
(NASA-TT-F-13188) Avail: CFSTI CSCL 06M

Research aimed at determining the effect of ultraviolet radiation on one-celled organisms is reported. Investigative results indicate the following: (1) Sensitivity to UV radiation is substantially different for various strains of red yeast. (2) Selection on the basis of resistance to UV rays may significantly increase the radiation resistance of the flagellates and red yeasts. (3) Resistant strains of flagellates and red yeasts resulting from systematic irradiation differ from strains without irradiation in their increased growth rate. (4) Weak doses UV radiation stimulated cell division in the flagellates, infusorians, and red yeasts, and increase motor activity in the flagellates and infusorians.  
D.L.G.

**N70-37511#** Department of Civil Aviation, Melbourne (Australia). Aviation Medicine Branch.  
**CONSEQUENCES OF TINTING IN AIRCRAFT WINDSHIELDS**  
B. A. J. Clark Feb. 1970 51 p refs  
(AM-Memo-26) Avail: CFSTI

An examination is made of some current types of aircraft windshield materials that reduce the amount of external light available to the pilot. The relevant technical literature is surveyed to find what effects this light reduction could have on pilots' vision. From this survey, it is concluded that any tinting is undesirable, and appropriate recommendations are made for the spectral-transmissive properties of windshields and other windows used by flight crew. Auxiliary light-reducing devices (visors, sunglasses) are also discussed.  
Author

**N70-37519#** Metropolitan Regional Council, Inc., New York.  
**AIR POLLUTION ABATEMENT. A REPORT TO LOCAL GOVERNMENT OFFICIALS ON THE ESTABLISHMENT OF AIR QUALITY CONTROL STANDARDS FOR THE NEW JERSEY-NEW YORK-CONNECTICUT INTERSTATE AIR QUALITY CONTROL REGION**  
Alan Neustadter Dec. 1969 47 p refs Sponsored in part by HUD  
(PB-191389) Avail: CFSTI CSCL 13B

The production of pollutants and an increasing need for pollution control standards are an inevitable consequence of technological society with a high standard of living. The pervasive nature of air pollution in the New Jersey-New York-Connecticut metropolitan region, its disregard or politico-geographic boundaries, including both state and local levels, and the national character of the technical, health, economic and political problems involved have made it necessary for the Federal government to assume leadership and exert its influence in developing a pollution abatement program on a national scale. Inherent within this approach is the concept that proper effectuation can only be achieved through active participation and total commitment at the state and local levels. USGRDR



**N70-37531\*** Scientific Translation Service, Santa Barbara, Calif.  
**COMPARATIVE STUDY OF SPECIFIC PROPERTIES OF VARIOUS FORMS OF TRANSPORTABLE (SOLUBLE) RIBONUCLEIC ACIDS AND AMINOACYL-R N A-SYNTHETASES [IZUCHENIE SPETSIFICHNOSTI TRANSPORTNYKH (RASTVORIMYKH) RIBONUKLEINOVYKH KISLOT I AMINOTASIL-RNK-SINTETAZ V SRAVNITELNOVIDOVOM ASPEKTE]**

G. N. Zaytseva Washington NASA Sep. 1970 8 p refs Transl. into ENGLISH from the book 'Abiogenez i Nachalnyye Stadii Evolyutsii Zhizni' Moscow, Nauka Press, 1968 p 92-96 (Contract NASw-2035)  
 (NASA-TT-F-13186) Avail: CFSTI CSCL 06A

Research conducted on the protein biosynthesis of four Chordata classes, invertebrates, higher plants, and microorganisms is described. The following were investigated: bobyx mori, saccharomyces cerevisiae, bac, brevis, and A. vinelandii. The genetic code is described. Author

**N70-37533\*** National Aeronautics and Space Administration, Marshall Space Flight Center, Huntsville.

**MDA EXTERNAL MOBILITY AIDS Simulation Test Report**

12 Sep. 1969 34 p

(NASA-TM-X-53894; MSFC-R-ME-IN-68-17) Avail: CFSTI CSCL 05E

A neutral buoyancy simulation for evaluating the multiple docking adapter (MDA) external mobility aids is described. The over-all objective of this test was to perform a human factors evaluation of the complete MDA external handrail system. Subjective and objective data obtained from the test subjects indicated that the handrail system was usable. However, additional handrails in several strategically located areas, especially around the conical section, would greatly aid an astronaut in making the necessary translations. All docking ports and scientific airlocks could be reached using the handrails, and work could be performed at these areas with the aid of tethers. Author

**N70-37559\*** Translation Consultants, Ltd., Arlington, Va.  
**THE ROLE OF MEDIATORS IN INDIVIDUAL DEVELOPMENT AND THE CHANGE IN THEIR FUNCTIONS IN THE PROCESS OF EVOLUTION**

G. A. Buznikov and I. V. Chudakova Washington NASA Sep. 1970 10 p Transl. in ENGLISH from the RUSSIAN (Contract NASw-2038)

(NASA-TT-F-13191) Avail: CFSTI CSCL 06C

The function of mediators in ontogenesis was examined. A change in their function from that of mitotic regulator to local hormone and finally to mediator is proposed. The presence is confirmed of mediatory substances in preneural evolutionary stages. Author

**N70-37564\*** Scientific Translation Serv, Santa Barbara, Calif.  
**RESPIRATORY SYSTEM OF BACTERIA IN THE LIGHT OF EVOLUTION [DYKHATELNYI APPARAT BAKTERII V SVETE EVOLUTSII]**

N. S. Gelman Washington NASA Sep. 1970 9 p refs Transl. into ENGLISH from the book 'Abiogenez i Nachalnyye Stadii Evolyutsii Zhizni' Moscow, Nauka Press, 1968 p 114-118 (Contract NASw-2035)

(NASA-TT-F-13187) Avail: CFSTI CSCL 06M

The functions of membranous structure in bacteria are described in view of recent research results. Research of the membranes of Micrococcus lysodeikticus was conducted by two

methods: breakdown of the membranes with EDTA and digestion of the membranes with lipolytic and proteolytic enzymes. Electrostatic bands were analyzed. Author

**N70-37576\*** Johns Hopkins Univ., Baltimore, Md. Myocardial Infraction Research Unit.

**[MYOCARDIAL INFRACTION RESEARCH UNIT] Annual Report, 1969**

1969 203 p refs

(Contract PH-43-67-1444)

(PB-190112) Avail: CFSTI CSCL 06E

Contents: Administration-operation-personnel; Clinical-core studies; Data management; Pathological studies; Animal studies. Author (USGRDR)

**N70-37581\*** Atomic Energy Commission Research Establishment, Lucas Heights (Australia).

**Tc 99m-IRON (II) COMPLEX: A NEW SUBSTANCE FOR BRAIN TUMORS SCINTIGRAPHY**

K. J. Schmidt et al Nov. 1969 5 p refs Transl. into ENGLISH from Atompraxis (West Germany), v. 14, no. 415, 1968 p 5-68

(LIB/Trans-237) Avail: AEC Depository Libraries

The application of Tc-99 labeled iron(II) complex for the brain tumor scintigraphy was found to be superior to Tc-99 labeled pertechnetate. The advantages of the complex lie in the relatively rapid decrease of the activity concentration in the blood because of excretion via the kidneys and in the enrichment of activity in the tumor. The radiation dose to the patient is also relatively low. The critical organ is the kidney, which is exposed to between 10 to 20 rads, when 20 mCi of Tc-99 labeled iron(II) complex is applied. NSA

**N70-37583\*** National Aeronautics and Space Administration, Marshall Space Flight Center, Huntsville, Ala.

**INTERNAL MOBILITY AIDS EVALUATION Simulation Test Report**

12 Sep. 1969 150 p

(NASA-TM-X-53895; MSFC-R-ME-IN-68-18) Avail: CFSTI CSCL 05E

The methods and procedures used in evaluating four internal mobility aid concepts for use in the Multiple Docking Adapter (MDA) are presented. The tests were conducted to determine which of the four concepts is best suited to: (1) translate from any docking port to the structural transition section control panel and windows, (2) stabilize and perform experiments at forward and aft windows, (3) transfer boxes of various sizes from one location in the MDA to another, and (4) translate from any point in the MDA to any other point. Evaluations were made for both shirtsleeve and vented pressure suit operations and the tests were conducted in a 25-foot diameter neutral buoyancy tank. Author

**N70-37585\*** National Aeronautics and Space Administration, Marshall Space Flight Center, Huntsville, Ala.

**EVALUATION OF ALCOHOL SPORULATION METHOD**

12 Sep. 1969 26 p refs

(NASA-TM-X-53891; MSFC-IN-R-ME-68-5) Avail: CFSTI CSCL 06M

An alcohol suspension of Bacillus subtilis variety niger spores was employed as an agent for controlled contamination of stainless steel strips. Test results indicate that this new method will provide a more accurate and controlled level of contamination and will result in cost and time reduction. The complete procedure to be followed is included. Author

## IAA ENTRIES

**A70-37236 #** Man in the aircraft control system (Chelovek v sisteme upravleniia samoletom). V. S. Frolov. Moscow, Voenizdat, 1970. 127 p. 19 refs. In Russian.

The role of the human factor in the aircraft control system is discussed in a plausible elementary fashion from the standpoint of engineering psychology. It is shown how this new science can help crew members cope with increasingly complex flight problems. Aspects of the 'human factor' are examined, and factors defining reliability of man are outlined. The characteristics required from a pilot are noted, and certain parallels between the operator of an electronic aircraft system and a general staff officer are drawn. Means of overcoming the 'language barrier' between man and the instrument panel are described. The book should be useful to anyone interested in achievements and advances of aviation. V.P.

**A70-37353** A new sensor for the continuous measurement and registration of the intracranial pressure of man (Un nouveau capteur pour la mesure et l'enregistrement continu de la pression intracranienne chez l'homme). *Génie Biologique et Médical*, vol. 1, Apr.-June 1970, p. 82-86. 9 refs. In French.

Description of an extradural device consisting of a rubber button with a thin plastic tube filled with physiological serum for transmission of the intracranial pressure to a transducer. The installation of the device at the outside of the dura mater is described. The sensor makes it possible to measure and record the intracranial pressure continuously in neurosurgical practice. Simultaneous recordings made using the extradural method described and an intraventricular procedure show complete agreement between data obtained by the two methods. G.R.

**A70-37354** The continuous registration of oxygen consumption of a muscular area (Enregistrement en continu de la consommation d'oxygène d'un territoire musculaire). A. Dittmar (Lyon, Université, Lyons, France). *Génie Biologique et Médical*, vol. 1, Apr.-June 1970, p. 87-94. In French.

Study of the oxygen consumption in the foot of a dog making use of an analog computing device. The parameters recorded include the determination of the rate of flow of the blood entering the area investigated and of the percentage of oxygen saturation of venous and arterious blood. Details of the methods of measurement used are discussed and the advantages of the analog computing device for the evaluation of the measured data are considered. G.R.

**A70-37355** Apparatus for the thermal calibrated stimulation of the vestibule (Appareil de stimulation thermique calibrée du vestibule). J.-J. Debain, G. Freyss, J. Danon, Y. Grall, and P. de Bonneval (Hôpital Saint-Antoine, France). *Génie Biologique et Médical*, vol. 1, Apr.-June 1970, p. 99-105. In French.

Discussion of a method for the stimulation of the vestibule which uses distilled water at 30 and 44 deg C for an injection into the ear. The basic principles of the new technique are examined and the appearance and the duration of the nystagmus are discussed. The method described makes it possible to conduct a great number of examinations a day. G.R.

**A70-37356** Contribution to the study of exhaled alveolar gas - Acquisition of data by a multichannel analyzer Didac 800 (Contribution à l'étude du gaz alvéolaire expiré - Acquisition de données au moyen d'un analyseur multicanaux Didac 800). P. Zouloumian, J. Meunier-Carus, J. Lonsdorfer, and J.-P. Schieber (Strasbourg, Université, Strasbourg, France). *Génie Biologique et Médical*, vol. 1, Apr.-June 1970, p. 106-111. In French.

Discussion of a method for the study of the exhaled alveolar gas which makes use of a mass spectrometer and the multichannel analyzer Didac 800. The frequently poor precision of values obtained by a method depending on the evaluation of measured data by a graphic procedure is shown and the advantages of the use of the Didac 800 are discussed. Examples are considered involving the determination of carbon dioxide pressure, oxygen pressure and gas volume. G.R.

**A70-37369** The energy budget of man at high altitudes. W. H. Terjung (California, University, Los Angeles, Calif.). *International Journal of Biometeorology*, vol. 14, Mar. 1970, p. 13-43. 19 refs. Research supported by the University of California.

Investigation of the human bioclimatological aspects of high altitude environment, based on high-altitude observations of the radiative physical and physiological parameters of importance to man. The physical energy balance climatology of the area is linked to the human energy balance climatology with respect to an altitudinal transect. Some of the major climatological factors which couple man to his radiative environment were observed, and a model which attempts to predict human net radiation against actual observations of human net radiation was tested. O.H.

**A70-37389** On the problem of decreased mental and physical performance of human beings as a sequelae of vaccination reactions (Zur Frage der psychischen und physischen Leistungsminderung beim Menschen als Folge von Impfreaktionen). G. Kleinhans and D. Wiegand (Institut für Wehrmedizin und Hygiene, Koblenz, West Germany). *Wehrmedizinische Monatsschrift*, vol. 14, July 1970, p. 158-169. 31 refs. In German.

Study of the effect of a T-oral vaccine and of a placebo vaccine on the body functions of a number of male subjects, and of the effect of the drug 'TAB-oral' on functions of mental performance. Mean body temperature, pulse rate, and blood pressure values were obtained before and after administration of a T-oral vaccine or a placebo vaccine. No difference between the groups treated and a control group receiving no drug could be found. It was also found that the drug 'TAB-oral' does not show a statistically confirmed action on such mental functions as speed of reaction and certainty of reaction, endurance, memory, attention stress, and sensory-motor coordination. The same is true for subjectively felt performance estimates in the mental as well as in the physical sector. G.R.

**A70-37404 #** Autoregulation of the heart (Samoregulatsiia serdtsa). N. M. Amosov, V. A. Lishchuk, S. A. Patskina, B. L. Palets, and I. L. Lissov. Kiev, Naukova Dumka, 1969. 160 p. 204 refs. In Russian.

This book discusses techniques of studying the functional capacity of an isolated animal heart for autoregulation to obtain a basis for heart activity simulation. Models using modern electronic and computer technology. The topics given detailed descriptions include the obtaining of cardio-pulmonary preparations and the maintenance of their functions during experiment, and the study of the dependence of the functional capacity of an isolated heart on pressure in the atrium dextrum and the aorta. Also considered are procedures for mathematical analysis of experimental data. Single-

## A70-37406

valued statistical characteristics of cardiac activity and autoregulation are obtained as a result. The book assumes a rigorous quantitative approach to physiological processes and is addressed to physiologists, physicians and engineers interested in biocybernetics. V.Z.

**A70-37406 #** The function of the equilibrium organ and motion sickness (*Funktsiia organa ravnovesiia i bolezni' peredvizheniia*). K. L. Khilov. Leningrad, Izdatel'stvo Meditsina, 1969. 280 p. 194 refs. In Russian.

Review of existing data concerning motion sickness and its prevention. A brief description is given of the physiology of the peripheral vestibular apparatus, and certain data concerning the role of the higher nervous system in the appearance of the symptoms of motion sickness are presented. Some rigorous vestibulological tests developed by the author and his coworkers to detect hypersensitivity of the vestibular apparatus are proposed. These tests include an otolithic reaction, a test involving cumulative otolithic stimulation, and an investigation of the vestibular sensitivity to Coriolis acceleration - i.e., tests simulating real situations occurring during the motion of an air transport. Recommendations are made concerning the prevention of motion sickness by training the vestibular analyzer to resist the effect of acceleration, including various special methods of active and passive gymnastics. With regard to individuals who have not undergone selection and training, certain pharmacological preparations are proposed which prevent the occurrence of vestibulo-vegetative reflexes. Finally, a study is made of the functioning of the vestibular apparatus in individuals chosen to be space pilots. A.B.K.

**A70-37407 #** Second signaling system and its physiological mechanisms (*Vtoraia signal'naia sistema i ee fiziologicheskie mekhanizmy*). G. A. Shichko. Leningrad, Izdatel'stvo Meditsina, 1969. 224 p. 314 refs. In Russian.

This monograph deals with the second signaling system - a system that plays a key role in the development of speech and thought in man and accounts for the effects of vocal stimuli on the cortical representation of unconditioned reflexes. The topics covered include methods of studying the relation between this system and the first signaling system, the importance of materialistic monism in studying the vocal system, the neurofunctional structure of cortical representation of unconditioned reflexes, and the mechanism of conditioned and unconditioned reflex activities. Also discussed are experiments in controlling the function of the salivary gland by human will, and suggestive and hypnotic phenomena. The monograph is intended for physiologists, psychiatrists, psychologists, and teachers. V.Z.

**A70-37525 #** Medicobiological problems of the utilization of outer space (*Mediko-biologicheskie problemy osvoeniia kosmosa*). V. V. Parin. *Zemlia i Vselennaia*, May-June 1970, p. 15-23. In Russian.

Discussion of medicobiological approaches to the realization of living conditions for sustained residence and activity of humans during prolonged flights in space vehicles. Successful Soviet experiments in biological oxygen, carbon dioxide, and water recycling are reviewed. An experiment during which physician Manovtsev, biologist Bozhko and technician Ulybyshev stayed one year in a sealed chamber performing routine activities and keeping a greenhouse for a biological life-support system is described in detail. V.Z.

**A70-37558** The radioprotective effects of psychotropic drugs. A. Locker and P. Weish (Österreichische Studiengesellschaft für Atomenergie GmbH., Vienna, Austria). *Experientia*, vol. 26, July

15, 1970, p. 771. 5 refs.

Discussion of tests involving the pretreatment of mice by injection of a number of neuroleptics and the subsequent irradiation of the mice in order to investigate the radio protective effects of the injected drugs. It was found that the neuroleptics Melleril, Sordinol, and Fluanxol cause a decrease in body temperature and oxygen consumption and increase the percentage of survivors after an exposure to lethal doses of X rays. G.R.

**A70-37564** Real-time analog display inputs. James G. Rogers. *Information Display*, vol. 7, July-Aug. 1970, p. 27-29. 9 refs.

Discussion of analog display inputs taking into consideration aspects of tracking in physiological control circuits and inputs to an electronic computer. The myotatic reflex loop in vertebrates is considered and differences between discrete and continuous tracking are examined. The nature of external feedback and a method which makes display gain a linear function of control input velocity are discussed. Various types of manual control are described and system parameters are investigated. G.R.

**A70-37747 \*** A microwave feeding system for extended space missions. E. M. Kenyon, P. C. Rinaldi, and J. W. Gould (U.S. Army, Food Laboratory, Natick, Mass.). *Journal of Microwave Power*, vol. 4, Dec. 1969, p. 258-272. 11 refs. NASA-supported research.

A preliminary feasibility study of a feeding system for extended space missions using microwave energy for heating and cooking prepared, prepackaged meals is described. Systems specifications are discussed. Heating results for typical food components and meals are given in terms of a small microwave oven, which is described. Methods are described for determining the uniformity of heating in the microwave cavity, which has dimensions 10 x 10 x 5 inches. Heating times, uniformity of heating, and efficiencies are given for various power settings and loads. Leakage measurements are given for the light-weight prototype system used. (Author)

**A70-37771 \*** Equidistance effects in visual fields. Walter C. Gogel (California, University, Santa Barbara, Calif.). *American Journal of Psychology*, vol. 82, Sept. 1969, p. 342-349. 11 refs. Grant No. NGR-05-010-010.

Description of an experiment on human perception of the size and distance of familiar objects presented both in an otherwise dark visual field and apparently suspended above the floor of a visual alley. In agreement with the expected effect of the equidistance tendency, the object appeared to be more distant and larger in the visual valley than in the reduced visual field. The results suggest that a familiar size is a valid but not very effective cue to perceived size and distance. T.M.

**A70-37772 \*** Cold exposure and intestinal absorption in the hamster. X. J. Musacchia and R. E. Barr (Missouri, University, Columbia, Mo.). *Federation Proceedings*, vol. 28, May-June 1969, p. 969-973. 17 refs. Grant No. NGR-20-004-021.

Experimental study of the relation between exposure to low ambient temperatures and changes in the absorptive capacity of the intestinal mucosa in hamsters. Using glucose as a test compound, it was seen clearly that the capacity for absorption varied during weeks of cold exposure. The initial drop in glucose absorption may be associated with an initial loss in weight by the hamster. Subsequent changes were interpreted as indicative of physiological adjustment due to cold acclimation. T.M.



**A70-37773 \*** Anomalous substrate specificities among the algal peroxidases. B. Z. Siegel and S. M. Siegel (Hawaii, University, Honolulu, Hawaii). *American Journal of Botany*, vol. 57, Mar. 1970, p. 285-287. Grant No. NGR-12-001-053.

Semipurified tissue preparations from 13 red and brown algae oxidized pyrogallol and p-coumaric acid but could not oxidize guaiacol and other ortho (methoxy)-substituted phenols, including common lignin precursors such as coniferaldehyde. They also failed to oxidize the aromatic amine, benzidine. In contrast, preparations from green algae were like horseradish peroxidase and vascular plant preparations in their ability to oxidize unsubstituted phenols, those substituted at one or both ortho-positions, and benzidine. One brown alga, *Postelsia*, was also unable to oxidize the commonplace peroxidase substrates, iodide and eugenol. These results suggest a phylogenetic limitation on the potential for lignification based upon enzyme stereospecificity. (Author)

**A70-37804 #** Parameter control of external respiration immediately after activation of a supplemental obstruction to the air entry (Upravlenie parametrami vnesnogo dykhanii neposredstvenno posle vklucheniia dopolnitel'nogo soprotivleniia vdokhu). L. A. Tenenbaum (Akademiia Nauk SSSR, Institut Avtomatiki i Telemekhaniki, Moscow, USSR). *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol. 69, June 1970, p. 14-17. 5 refs. In Russian.

Study of the reaction of the diaphragmatic muscle and the changes in the pneumogram of adult not-narcotized rabbits upon obstruction of air passage immediately after the activation of the obstruction. It is shown that the activity of the diaphragm does not change at the moment of obstacle activation. However, diaphragm effort increases due to prolonged inspiration. On the basis of the test results it is concluded that the duration of inspiration is a function both of the lung volume and the effort exerted by the respiratory muscles. G.R.

**A70-37805 #** Effect of preliminary training to altitude hypoxia on the cardiac contractile function at acute overstrain (Vliianie predvaritel'noi trenirovki k vysotnoi gipoksii na sokratitel'nyu funktsiiu serdtsa pri ostroi peregruzke). G. I. Markovskaia (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR). *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol. 69, June 1970, p. 23-26. In Russian.

Study of the influence of preliminary training to altitude hypoxia on myocardial contraction in male rats. The rats were trained for 40 days in a pressure chamber under conditions simulating altitudes from 1000 m to 6000 m. In these animals, as well as in nontrained rats, acute overstrain of the heart was created by means of experimental coarctation of the aorta. It was found that intraventricular pressure was significantly reduced in nontrained animals while such a decrease does not occur in trained animals in similar conditions. It is concluded that preliminary training to altitude hypoxia increases the resistance of the myocardium to acute overstrain caused by experimental failure. G.R.

**A70-37806 #** Thermal thermesthesiometer (Teplovoi termoezestrometr). L. M. Kurilova and I. I. Tikhomirov (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR). *Biulleten' Eksperimental'noi Biologii i Meditsiny*, vol. 69, June 1970, p. 123, 124. 9 refs. In Russian.

Discussion of a device called the thermal thermesthesiometer which makes it possible to investigate the sensibility of the skin to heat by the method of functional mobility. The design of the device is described. The instrument is portable, line or battery powered. The various component parts of the device are described and its principles of operation are discussed. G.R.

**A70-37809** Mathematical representation of the mechanical properties of the heart muscle. Yuan-Cheng Fung (California, University, La Jolla, Calif.). *Journal of Biomechanics*, vol. 3, July 1970, p. 381-404. 41 refs. NIH Grant No. HE-12494-01; Grant No. AF AFOSR 1186-67c.

Mathematical formulation of the mechanical properties of the heart muscle on the basis of the sliding-element theory and Hill's model. The purpose of the formulation is to unify the picture, resolve the conflicts, and describe the complex phenomenon of the mechanical properties of the heart muscle in a compact set of equations. A specific form is proposed for representing the tensile stress in the parallel and series elements, respectively. M.M.

**A70-37810** The mechanics of muscle function in locomotion. J. B. Morrison (MIT, Cambridge, Mass.). *Journal of Biomechanics*, vol. 3, July 1970, p. 431-451. 17 refs. NIH-supported research.

An engineering analysis has been developed which enables the forces transmitted by the joints of the lower limb to be calculated from experimental data. This paper describes a further extension of the analysis to investigate the mechanics of muscle action in locomotion. The results describe the relation of muscle tension to length and velocity and the function of muscle in the production and absorption of energy. (Author)

**A70-37811 \*** Phase coherence of the alpha rhythm during photic blocking. Sanders Goldstein (NASA, Electronics Research Center, Cambridge, Mass.). *Electroencephalography and Clinical Neurophysiology*, vol. 29, Aug. 1970, p. 127-136. 11 refs.

Examination of the pre- to post-blocked phase angle relationship of the photically blocked alpha rhythm in the light of a pacemaker model. The question is asked whether this pacemaker is in continuous operation during photic blocking even though, within this period, the detected alpha oscillation may vanish. The results obtained are consistent with the idea of a basic pacemaking system, but because of conservation of phase information during the photic block, they are at variance with the concept that photically induced desynchronization must take place at the pacemaker level. M.M.

**A70-37812** The interaction of visual attention and temporal cortex stimulation on electrical activity evoked in the striate cortex. L. K. Gerbrandt, D. N. Spinelli, and K. H. Pribram (Stanford University, Stanford, Calif.). *Electroencephalography and Clinical Neurophysiology*, vol. 29, Aug. 1970, p. 146-155. 15 refs. NIH Grant No. MH-12970.

Description of four experiments which were directed at finding an index of the activity of the infero-temporal (IT) cortex on the visual system of monkeys. The measure, a potential evoked in the striate cortex by geniculate stimulation was shown to be sensitive to IT stimulation only when monkeys were in an inattentive state. M.M.

**A70-37813 \*** The contingent negative variation and the late positive wave of the average evoked potential. E. Donchin and D. B. D. Smith (NASA, Ames Research Center, Moffett Field, Calif.). *Electroencephalography and Clinical Neurophysiology*, vol. 29, Aug. 1970, p. 201-203. 12 refs.

Description of the results of the replication of a study by Donchin and Cohen (1967) which concentrated on analyzing the EEG with an interest in post-stimulus events. It was found that stimuli that are task relevant elicit an averaged evoked potential (AEP) that shows an enhanced positive component with a peak latency between 200 and 300 msec. The contingent negative

variation (CNV) usually terminates with a positive wave with a latency of approximately 300 msec. The possibility that these two phenomena are related was investigated.

M.M.

**A70-37843** Application of thermal-electronic instrumentation to biological flows. Edwin M. Wilson (Alabama, University, Birmingham, Ala.). In: Engineering for the 70's; Institute of Electrical and Electronics Engineers, Annual Region III Convention, 8th, Huntsville, Ala., November 19-21, 1969, Proceedings. (A70-37842 19-10) Edited by S. Kastorff. Huntsville, Ala., Institute of Electrical and Electronics Engineers, Inc., 1969, p. 45-50. 18 refs.

This paper describes some of the work now underway at the University of Alabama Medical Center on the measurement of biological flows using thermal-electronic instrumentation. These include total blood flow, i.e., cardiac output, as well as blood flow in certain regions such as the estimation of cerebral flow by bilateral measurements of jugular return. The cardiac output measurements are to be completely automated operating under computer control. In addition, instrumentation similar to that used for measuring flows is also being used for indirect measurement of compartment volumes, e.g., left ventricular end-diastolic volumes.

(Author)

**A70-37844** A detector for water vapor content of respiratory gases. A. Wayne Bennett, T. J. Luck (Virginia Polytechnic Institute, Blacksburg, Va.), and O. L. Updike (Virginia, University, Charlottesville, Va.). In: Engineering for the 70's; Institute of Electrical and Electronics Engineers, Annual Region III Convention, 8th, Huntsville, Ala., November 19-21, 1969, Proceedings. (A70-37842 19-10) Edited by S. Kastorff. Huntsville, Ala., Institute of Electrical and Electronics Engineers, Inc., 1969, p. 51-55. 7 refs.

The feasibility of a quartz-crystal microbalance for monitoring the water vapor content of respiratory gases has been shown with a twin-crystal design employing uncoated crystals. The oscillation frequency of the sensor crystal, shifted by the mass loading of sorbed water, is subtracted from that of a reference crystal which may provide compensation for temperature or contamination. Speed of response is sufficient to resolve the humidity waveform in a breath-by-breath analysis. Step or square-wave testing indicates an effective time constant around 200 msec, probably that of the test chamber. Sensor output may be taken as a varying frequency in the 1-10 kHz region or as a d-c voltage.

(Author)

**A70-37845** Characteristics of the spatio-temporal visual evoked response in man. J. R. Bourne, D. G. Childers, and N. W. Perry, Jr. (Florida, University, Gainesville, Fla.). In: Engineering for the 70's; Institute of Electrical and Electronics Engineers, Annual Region III Convention, 8th, Huntsville, Ala., November 19-21, 1969, Proceedings. (A70-37842 19-10) Edited by S. Kastorff. Huntsville, Ala., Institute of Electrical and Electronics Engineers, Inc., 1969, p. 56-59. PHS Grants No. NB-06875; No. NB-06654.

The spatio-temporal characteristics of the visual evoked response (VER) in man were determined by recording from 17 miniature electrodes on the occipital scalp. Two and three dimensional displays of the spatial distribution of the evoked scalp potentials were made from the summated VER waveforms obtained from 16 bipolar electrode pairs. The prominent spatio-temporal characteristic of the VER appears to be a rotation of the potential gradient in the same period as the input stimulus.

(Author)

**A70-37846** Low frequency activity in the visual evoked response - Signal or noise. D. G. Childers, C. L. Kirksey, T. C. Doyle, and N. W. Perry, Jr. (Florida, University, Gainesville, Fla.). In: Engineering for the 70's; Institute of Electrical and Electronics

Engineers, Annual Region III Convention, 8th, Huntsville, Ala., November 19-21, 1969, Proceedings. (A70-37842 19-10) Edited by S. Kastorff. Huntsville, Ala., Institute of Electrical and Electronics Engineers, Inc., 1969, p. 60-65. 16 refs. PHS Grants No. NB-06875; No. NB-06654.

A preliminary description of the research activity in the Visual Sciences Laboratory of the University of Florida is provided to acquaint the reader with terminology and methodology. Next the phenomenon of low frequency activity in the visual evoked response is examined to determine its relationship to visual stimulation. The origin of this activity is discussed, and the effects of removing this activity by filtering are examined.

(Author)

**A70-37856** A multipurpose biomedical telemetry system. A. Wayne Bennett (Virginia Polytechnic Institute, Blacksburg, Va.) and Walter F. O'Brien, Jr. (Litton Industries, Inc., Poly-Scientific Div., Blacksburg, Va.). In: Engineering for the 70's; Institute of Electrical and Electronics Engineers, Annual Region III Convention, 8th, Huntsville, Ala., November 19-21, 1969, Proceedings. (A70-37842 19-10) Edited by S. Kastorff. Huntsville, Ala., Institute of Electrical and Electronics Engineers, Inc., 1969, p. 268-273.

The design and development of a microminiature multipurpose biomedical telemetry system is presented. The system utilizes hybrid and integrated circuits and requires no external data link connections. It features modular single channel wide-band units and four channel multiplexing units that can be used in any combination. The units are designed to work with a variety of sensors as the application may dictate. The units are internally temperature compensated and are accurate to plus or minus 2-1/2% of full range. Each module requires 0.325 cubic inches of space and less than 0.8 watts of power. The system design includes receiving and data conditioning equipment that can be modified versions of commercially available equipment.

(Author)

**A70-37875** Man-machine interface simulation considerations in advanced instrumentation systems. James L. Eberle and Raymond E. Leader (Boeing Co., Seattle, Wash.). In: Instrumentation in the aerospace industry. Volume 16 - Instrument Society of America, International Aerospace Instrumentation Symposium, 16th, Seattle, Wash., May 11-13, 1970, Proceedings. (A70-37873 19-14) Edited by B. Washburn. Pittsburgh, Instrument Society of America, 1970, p. 4-13.

Consideration of recent advances in display/control technology, which have provided means for high performance input/output between man and machine. Working with raw or processed data, man can select alternate methods of processing, check validity, smooth the data, halt or select alternate modes or phases, and perform other applicable functions. Generalized methods of man-in-the-loop simulation are described, which are used to determine workable and efficient configurations for specified systems.

F.R.L.

**A70-37977** Survival in cold water: The physiology and treatment of immersion hypothermia and of drowning. W. R. Keatinge (Oxford University, Oxford, England). Research supported by the Medical Research Council. Oxford, Blackwell Scientific Publications, 1969. 135 p. 294 refs. \$3.60.

The nature and scope of the problem of a death by drowning or immersion in cold water is examined and the recent experiments showing the real hazards of immersion are summarized. The mechanism for maintaining the body temperature in cold water is examined and the limitations of the body's power to control heat losses are discussed. The effect of exercises and clothing on the body

temperature is examined taking into account different temperatures of water. It is concluded that in great majority of cases exercise accelerates death from hypothermia. Clothing helps to maintain the body temperature above 10 deg C for people who keep still in water as cold as 5 deg C. The experiments pertaining to the cold vasodilatation and heat loss in water at near 0 deg C are reviewed. Factors affecting the central control of the body temperature are reviewed and the modifications of this control due to old age, alcohol, and acclimatization are discussed. The biological consequences and treatment of hypothermia are presented. The cold injury of limbs and its treatment is discussed. The mechanism of drowning and a sudden death during immersion in cold water are studied. A summary of practical advice is included. The book is intended mainly for medical men and physiologists although much of it will interest laymen liable to be immersed or to assist in rescues.

Z.W.

**A70-38006 \*** A preliminary model of serum growth hormone response to hypoglycemia in man. D. R. Young, J. C. Howard, L. N. Trigg (NASA, Ames Research Center, Biotechnology Div., Moffett Field, Calif.), and J. F. Garcia (California, University, Berkeley, Calif.). *Computers and Biomedical Research*, vol. 3, Feb. 1970, p. 74-87, 25 refs.

A simplified, linearized model of the system relating serum growth hormone response to hypoglycemia is reviewed. This model, which predicts a critically damped response to intravenous insulin administration, lumps several kinetic and regulatory parameters into a smaller number which characterizes the human regulatory system. Computed responses based upon the model conform well with direct measurements of blood glucose and growth hormone concentrations following insulin administration. The effect of parameter variations is simulated and their implications discussed. (Author)

**A70-38012** Milk to air ratios for I-131 concentrations (Project Rover). D. E. Bernhardt (U.S. Public Health Service, Southwestern Radiological Health Laboratory, Las Vegas, Nev.). In: Environmental surveillance in the vicinity of nuclear facilities; Health Physics Society, Symposium, Augusta, Ga., January 24-26, 1968, Proceedings. Edited by W. C. Reinig. Springfield, Ill., Charles C. Thomas, Publisher, 1970, p. 294-301.

Determination of empirical parameters which can be used in the prediction program for radioiodine concentrations in milk resulting from tests of the Nuclear Rocket Development Station in Nevada. Specifically, the purpose is to determine the 'transport ratio' for I-131 air to milk concentrations. Both the mean for the value and its statistical variation are of interest. The results are limited to concentrations for the time of the year when the cows are on fresh feed. T.M.

**A70-38051** Identification and the form of multidimensional discrimination space. G. R. Lockhead (Duke University, Durham, N.C.). *Journal of Experimental Psychology*, vol. 85, July 1970, p. 1-10. 19 refs. NSF Grant No. GB-4916.

It is proposed that people identify multidimensional stimuli as if they are loci in a multidimensional discrimination space and not by combining judgments of the separate values of each stimulus. Identification data from 2-, 3-, and 4-dimensional stimulus sets support the model. According to this proposition, there is no theoretical limit on the number of different stimuli or objects which can be discriminated, although there is a practical limit on the number which can be identified due to the time required to learn and attach labels to each locus in the space. (Author)

**A70-38052 \*** Prismatic adaptation under scotopic and photopic conditions. Ann M. Graybiel and Richard Held (MIT, Cambridge, Mass.). *Journal of Experimental Psychology*, vol. 85, July 1970, p. 16-22. 28 refs. NIH Grant No. MH-07642; Grant No. NGR-22-009-308.

Prismatic rearrangement experiments were performed under scotopic and photopic conditions by suitably dark- or light-adapted Ss. Adaptation to prismatic displacement was highly significant when exposure and test procedures were carried out under scotopic as well as photopic conditions. Transfer experiments suggest that scotopically induced adaptation can be demonstrated under both scotopic and photopic conditions of marking, whereas photopically induced adaptation is evidenced primarily under photopic test conditions and shows significantly reduced transfer to scotopic test conditions.

(Author)

**A70-38053** Effects of heat stress on the performance of two tasks running concurrently. K. A. Provins (Australian National University, Canberra, Australia) and C. R. Bell (London School of Hygiene and Tropical Medicine, London, England). *Journal of Experimental Psychology*, vol. 85, July 1970, p. 40-44. 8 refs.

Twenty Ss performed a five-choice serial reaction time (SRT) task at each of two paces while watching for infrequent light signals from six different parts of the visual field in both cool (20 C/15 C dry bulb/wet bulb) and hot (40 C/35 C dry bulb/wet bulb) environmental conditions. An initially beneficial effect of heat on performance of the fast-paced SRT task was lost with continued exposure to heat, but no climatic effect was found on performance of the visual vigilance task. The results are discussed in terms of 'arousal' and are considered to support the view that the effect of heat exposure on perceptual-motor performance is more directly related to body temperature than the climatic conditions. (Author)

**A70-38054** Eye movements during visual search and discrimination of meaningless, symbol, and object patterns. John D. Gould (IBM Corp., Thomas J. Watson Research Center, Yorktown Heights, N.Y.) and David R. Peeples (Brown University, Providence, R.I.). *Journal of Experimental Psychology*, vol. 85, July 1970, p. 51-55. 12 refs.

The eye movements of human Ss were recorded during a visual search task in which Ss determined how many of eight patterns, arranged in a square around a standard pattern, matched a standard pattern. Three classes of patterns, equated on the basis of four physical dimensions, were studied: meaningless patterns, symbols, and objects. It was found overall that the class to which a pattern belonged did not affect total scan time, errors, fixation duration, or number of eye fixations. It was tentatively concluded for visual search tasks that pattern discrimination is based upon physical characteristics of patterns rather than meaningful characteristics of the patterns. (Author)

**A70-38055 \*** Response bias explanation of conservative human inference. Wesley M. DuCharme (Rice University, Houston, Tex.). *Journal of Experimental Psychology*, vol. 85, July 1970, p. 66-74. 9 refs. Grant No. NGR-23-005-171.

Conservative human inference has been attributed to misperception or misaggregation of data, but it may be caused by response biases. In the present experiments, Ss revised odds estimates about which one of two normal distribution data generators was being sampled. An analysis of special sequences and a plot of revised odds against theoretical odds showed a bias in Ss' response functions. They revised odds optimally only over a range of plus or minus 1.0 log odds. When E set different levels of prior odds, the response functions shifted so that the optimal range centered around the set

prior odds. A second experiment showed that the biased functions remained invariant over changes in data generator familiarity and diagnosticity. Of the several explanations offered for these response functions, an odds bias seems the most likely. Whatever the cause of the bias, Ss neither misaggregated nor misperceived data within their optimal range. (Author)

**A70-38206**      **Methods of collecting and analyzing physiological data (Metody sbora i analiza fiziologicheskoi informatsii).** Edited by M. V. Radzinskaia. Moscow, Izdatel'stvo Nauka, 1969. 314 p. In Russian.

#### Contents:

Physical bases of selection of an optimal system of leads for electrocardiography (Fizicheskie osnovy vybora optimal'noi sistemy otvedeniia dlia elektrokardiografii). I. Sh. Pinsker, B. M. Tsukerman, and L. I. Titomir, p. 5-14. 10 refs. (See A70-38207 19-05)

Study of leads which are sensitive to displacements of the electric dipole of the heart (Issledovanie otvedeniia, chuvstvitel'nykh k peremeshcheniiam elektricheskogo dipolia serdtsa). L. I. Titomir, p. 24-30. 8 refs. (See A70-38208 19-05)

Estimating the displacement of the electric dipole of the heart (Otsenka smeshcheniia elektricheskogo dipolia serdtsa). I. Sh. Pinsker and V. V. Shakin, p. 50-55. (See A70-38209 19-05)

Methods of correcting resonance distortions of a high-frequency ballistocardiogram (O sposobakh korrektsii rezonansnykh iskazhenii vysokochastotnoi ballistokardiogrammy). M. I. Tishchenko, p. 58-65. 15 refs. (See A70-38210 19-05)

Spectral analysis of ballistocardiograms of healthy subjects with the aid of computers (Spektral'nyi analiz ballistokardiogramm zdorovykh liudei s pomoshch'iu ETsVM). G. I. Sidorenko and G. K. Afanas'ev, p. 66-71. 7 refs. (See A70-38211 19-05)

Use of electronic and television equipment in studies of peripheral vasculocapillary blood circulation (Primenenie radioelektroniki i televizionnoi tekhniki v issledovaniakh perifericheskogo sosudisto-kapillarnogo krovoobrashcheniia). G. S. Litvin, p. 71-80. 13 refs. (See A70-38212 19-05)

Use of electrometric dc amplifiers in studies of intracellular myocardium potentials (Primenenie elektrometricheskikh usilitel'ei postoiannogo toka dlia issledovaniia vnutrikletchnykh potentsialov miokarda). L. V. Rozenshtaukh, S. A. Iur'ev, and A. V. Iushmanova-Rakova, p. 88-102. 44 refs. (See A70-38213 19-05)

A digital data device for analyzing rhythmic biological processes of a certain class (Informatsionno-tsifrovoe ustroistvo dlia analiza ritmicheskikh biologicheskikh protsessov opredelenno klassa). G. Astardzhian, Khr. Radev, Ch. Nachev, and K. Boev, p. 102-117. (See A70-38214 19-05)

A servosystem for continuous measurement of mean arterial pressure (Slediashchaia sistema dlia nepreryvnogo izmereniia srednego arterial'nogo davleniia). V. A. Reeben and M. A. Epler, p. 117-123. (See A70-38215 19-05)

Current problems of dynamic biotelemetry (Sovremennye problemy dinamicheskoi biotelemetrii). V. V. Rozenblat, p. 123-138. 26 refs. (See A70-38216 19-05)

Multiple leadout of bioelectric potentials, their commutation, and automatic analysis (Mnozhestvennoe otvedenie bioelektricheskikh potentsialov, ikh kommutatsiia i avtomaticheskii analiz). V. M. Anan'ev, p. 202-227. 19 refs. (See A70-38217 19-05)

A method of studying mechanisms of self-regulation of the brain (Metod issledovaniia mekhanizmov samoregulatsii golovnogo mozga). P. V. Bundzen and D. N. Menitskii, p. 233-240. 21 refs. (See A70-38218 19-05)

An electronic differentiator for physiological studies (Elektronnyi differentsiator dlia fiziologicheskikh issledovaniia). V. L. Utkin, p. 266-272. (See A70-38219 19-05)

A device for determining the stability of standing and support reactions in humans (Pribor dlia opredeleniia ustoiichivosti stoianiia i opornykh reaktsii cheloveka). A. B. Venediktov, Iu. V. Terekhov, and M. I. Tishchenko, p. 281-288. 6 refs. (See A70-38220 19-05)

**A70-38207 #**      **Physical bases of selection of an optimal system of leads for electrocardiography (Fizicheskie osnovy vybora optimal'noi sistemy otvedeniia dlia elektrokardiografii).** I. Sh. Pinsker, B. M. Tsukerman, and L. I. Titomir. In: Methods of collecting and analyzing physiological data (Metody sbora i analiza fiziologicheskoi informatsii). (A70-38206 19-05) Edited by M. V. Radzinskaia. Moscow, Izdatel'stvo Nauka, 1969, p. 5-14. 10 refs. In Russian.

Formulation of the general problem of electrocardiography, and discussion of two approaches to the solution of this problem - namely, the empirical and the physical approaches. The advantages of physically based methods of choosing an optimal system of leads for electrocardiography - i.e., a system which gives all the information concerning the electrical state of the heart required for diagnostics and contains the minimum number of leads - are noted. A convenient method of mathematical description of the heart as an electrical generator and of a lead as a measuring device is indicated. A brief review is given of methods of determining the parameters of electrocardiographic leads, with particular attention being devoted to electrophysical modeling. A.B.K.

**A70-38208 #**      **Study of leads which are sensitive to displacements of the electric dipole of the heart (Issledovanie otvedeniia, chuvstvitel'nykh k peremeshcheniiam elektricheskogo dipolia serdtsa).** L. I. Titomir. In: Methods of collecting and analyzing physiological data (Metody sbora i analiza fiziologicheskoi informatsii). (A70-38206 19-05) Edited by M. V. Radzinskaia. Moscow, Izdatel'stvo Nauka, 1969, p. 24-30. 8 refs. In Russian.

Description of a system of leads of electrical bridge type based on the phenomenon of 'potential quenching.' The system possesses selective sensitivity to the quadrupole components of a multipole cardiac generator to which corrected vectorcardiographic lead systems are almost insensitive. If it is assumed that a cardiac generator constitutes a moving point current dipole with a known moment (which can be determined, for example, with the aid of an accurate vectorcardiographic system), the proposed leads make it possible to determine the displacement of this dipole in a transverse plane of the body. An approximate estimate is made of the accuracy of determining the dipole displacement on the basis of the results of theoretical calculations and experiments on electrophysical models. A.B.K.

**A70-38209 #**      **Estimating the displacement of the electric dipole of the heart (Otsenka smeshcheniia elektricheskogo dipolia serdtsa).** I. Sh. Pinsker and V. V. Shakin. In: Methods of collecting and analyzing physiological data (Metody sbora i analiza fiziologicheskoi informatsii). (A70-38206 19-05) Edited by M. V. Radzinskaia. Moscow, Izdatel'stvo Nauka, 1969, p. 50-55. In Russian.

Demonstration that an attempt to replace a precordial lead by a linear combination of orthogonal (Schmidt) reference leads yields a remainder which cannot be explained by errors in the EXG recording. It is concluded that this attests to the ineffectiveness of the hypothesis of a stationary point dipole. From the standpoint of a moving dipole hypothesis it is demonstrated that a satisfactory explanation of the precordial lead is obtained, if the motion of the dipole over the QRS interval is assumed to be rectilinear and uniform. It is proposed that the mean dipole displacement be estimated by supplementing the orthogonal leads with one precordial lead. A.B.K.

**A70-38210 #**      **Methods of correcting resonance distortions of a high-frequency ballistocardiogram (O sposobakh korrektsii rezonansnykh iskazhenii vysokochastotnoi ballistokardiogrammy).** M. I. Tishchenko. In: Methods of collecting and analyzing physiological data (Metody sbora i analiza fiziologicheskoi informatsii). (A70-

38206 19-05) Edited by M. V. Radzinskaia. Moscow, Izdatel'stvo Nauka, 1969, p. 58-65. 15 refs. In Russian.

Demonstration that mechanical methods of correcting resonance distortions of a ballistocardiogram are unsuitable in the case of high-frequency ballistocardiographs. It is shown that electrical selective filters can, in all likelihood, ensure sufficient correction of high-frequency ballistocardiograms. A specific high-frequency ballistocardiograph is recommended as being suitable and convenient for the correction of resonance distortions of ballistocardiograms.

A.B.K.

**A70-38211 # Spectral analysis of ballistocardiograms of healthy subjects with the aid of computers (Spektral'nyi analiz ballistokardiogramm zdorovykh liudei s pomoshch'iu ETsVM).** G. I. Sidorenko and G. K. Afanas'ev. In: Methods of collecting and analyzing physiological data (Metody sbora i analiza fiziologicheskoi informatsii). (A70-38206 19-05) Edited by M. V. Radzinskaia. Moscow, Izdatel'stvo Nauka, 1969, p. 66-71. 7 refs. In Russian.

Calculation of the ballistocardiogram autocorrelation function and spectrum with the aid of a specially developed program, using a scanning graph decoder and a computer. The spectra of normal ballistocardiograms and criteria for evaluating them are presented. It is shown that the total power of a ballistocardiogram spectrum can be determined, as well as the periodicity of the harmonics and the degree of concentration of energy in the harmonics. These criteria, which are inaccessible to ordinary visual analysis, make it possible to perform objective evaluations of cardiovascular activity.

A.B.K.

**A70-38212 # Use of electronic and television equipment in studies of peripheral vasculocapillary blood circulation (Primenenie radioelektroniki i televizionnoi tekhniki v issledovaniakh perifericheskogo sosudisto-kapilliarnogo krovoobrashcheniia).** G. S. Litvin. In: Methods of collecting and analyzing physiological data (Metody sbora i analiza fiziologicheskoi informatsii). (A70-38206 19-05) Edited by M. V. Radzinskaia. Moscow, Izdatel'stvo Nauka, 1969, p. 71-80. 13 refs. In Russian.

Description of an arrangement for studying peripheral vasculocapillary blood circulation by a combination of television UV capillaroscopy and electronic finger plethysmography. The proposed arrangement is based on the principle of frequency lock-on of two high-frequency autooscillators and the use of their resulting synchronizing current. It is shown that simultaneous investigation of peripheral blood circulation by electronic finger plethysmography and television UV capillaroscopy results in a clearer characterization of the reactions of peripheral vessels and makes it possible to ascertain their capillary or arteriole components.

A.B.K.

**A70-38213 # Use of electrometric dc amplifiers in studies of intracellular myocardium potentials (Primenenie elektrometricheskikh usilitelei postoiannogo toka dlia issledovaniia vnuktrikletokhnykh potentsialov miokarda).** L. V. Rozenshtaukh, S. A. Iur'ev, and A. V. Iushmanova-Rakova. In: Methods of collecting and analyzing physiological data (Metody sbora i analiza fiziologicheskoi informatsii). (A70-38206 19-05) Edited by M. V. Radzinskaia. Moscow, Izdatel'stvo Nauka, 1969, p. 88-102. 44 refs. In Russian.

Consideration of the characteristics of electrometric dc amplifiers with positive and negative feedback. Circuit diagrams of these devices are presented. An analysis is made of the results of an application of these amplifiers to a study of the action potentials of various regions of the heart under conditions of vagus inhibition.

A.B.K.

**A70-38214 # A digital data device for analyzing rhythmical biological processes of a certain class (Informatsionno-tsifrovoe ustroistvo dlia analiza ritmicheskikh biologicheskikh protsessov opredelennoogo klassa).** G. Astardzhiian, Khr. Radev, Ch. Nachev, and K. Boev. In: Methods of collecting and analyzing physiological data (Metody sbora i analiza fiziologicheskoi informatsii). (A70-38206 19-05) Edited by M. V. Radzinskaia. Moscow, Izdatel'stvo Nauka, 1969, p. 102-117. In Russian.

Description of the principle of operation of a device for analyzing disturbances of cardiac rhythm, respiration, and rhythmical processes of the alimentary tract. The proposed device, which employs techniques of mathematical logic, is capable of determining the frequency of the rhythm of the process being analyzed and of comparing it to certain established norms, detecting an acceleration of the rhythm above the norm or a deceleration below the norm, detecting the appearance of single irregular pulses or groups of such pulses, recording disturbances of the rhythm with respect to number in a given period, generating a signal upon occurrence of an emergency situation, and generating a signal during stoppage of the rhythm for a period greater than a preassigned period.

A.B.K.

**A70-38215 # A servosystem for continuous measurement of mean arterial pressure (Slediaschchaia sistema dlia nepreryvnogo izmereniia srednego arterial'nogo davleniia).** V. A. Reebe and M. A. Epler. In: Methods of collecting and analyzing physiological data (Metody sbora i analiza fiziologicheskoi informatsii). (A70-38206 19-05) Edited by M. V. Radzinskaia. Moscow, Izdatel'stvo Nauka, 1969, p. 117-123. In Russian.

Description of a device for use in physiological and clinical functional studies of human arterial pressure dynamics. The basis of measurements of mean arterial pressure is a determination of the external compression pressure at which the intraarterial pressure pulse oscillations are maximum with respect to amplitude. The automatic control system operates according to the principle of comparing pulsations received simultaneously from two fingers with the aid of two pneumatic measuring cuffs with different counter-pressure levels. Determination of the maximum amplitude of the oscillations by the method of differential measurement increases the measurement rate and accuracy and decreases the noise sensitivity of the device.

A.B.K.

**A70-38216 # Current problems of dynamic biotelemetry (Sovremennye problemy dinamicheskoi biotelemetrii).** V. V. Rozenblat. In: Methods of collecting and analyzing physiological data (Metody sbora i analiza fiziologicheskoi informatsii). (A70-38206 19-05) Edited by M. V. Radzinskaia. Moscow, Izdatel'stvo Nauka, 1969, p. 123-138. 26 refs. In Russian.

Consideration of the problems arising in the further development of dynamic radio telemetry in physiology and medicine. Among the problems touched upon are the need to improve the operating characteristics of the equipment, including the need to refine the medico-engineering requirements on instruments used for studies in various fields, the need to take into account a number of principles of equipment design which facilitate the use of this equipment by the physiologist, and a number of specific problems on improving transmitting and receiving devices. The need to increase the number of recordable parameters is stressed, and the probable course of development of work in this area is outlined. The need to develop multichannel systems is noted, and problems of channel compression and rational selection of methods of separating channels are considered. Finally, the need to develop devices for automatic data processing and analysis is demonstrated.

A.B.K.

**A70-38217 # Multiple leadout of bioelectric potentials, their commutation, and automatic analysis (Mnozhestvennoe otvedenie bioelektricheskikh potentsialov, ikh kommutatsiia i avtomaticheskii**

analiz). V. M. Anan'ev. In: Methods of collecting and analyzing physiological data (Metody sbora i analiza fiziologicheskoi informatsii). (A70-38206 19-05) Edited by M. V. Radzinskaia. Moscow, Izdatel'stvo Nauka, 1969, p. 202-227. 19 refs. In Russian.

Consideration of the possibility of developing a unified method of multipoint recording of the bioelectric potentials of various organs and systems of humans and animals on the basis of the method of electroencephalography. The proposed method includes four basic operations - namely, multiple leadout, amplification, recording, and analysis of potentials. Certain problems in the leadout of bioelectric potentials are considered, a semiconductor system of multichannel commutation is described, and a totally automatic system of analysis of electrophysiological data by means of computer technology is developed. An automatic analysis of data obtained by this method is performed in two stages, the first stage being a preliminary amplitude analysis, while the second is a mathematical treatment of the data obtained from the preliminary analysis. A.B.K.

A70-38218 # A method of studying mechanisms of self-regulation of the brain (Metod issledovaniia mekhanizmov samoregulatsii golovnogo mozga). P. V. Bundzen and D. N. Menitskii. In: Methods of collecting and analyzing physiological data (Metody sbora i analiza fiziologicheskoi informatsii). (A70-38206 19-05) Edited by M. V. Radzinskaia. Moscow, Izdatel'stvo Nauka, 1969, p. 233-240. 21 refs. In Russian.

Application of a method of electroencephalography with automatic EEG frequency analysis. A stimulus based on the feedback principle is employed as the functional load. In contrast to an ordinary trigger photostimulus, the special feature of this method is the use of a narrow-band filter in the feedback, which, in combination with a delay unit, makes it possible to produce a stimulus from the mean activity level in the alpha rhythm range. The use of various modifications of this method makes it possible to simulate certain processes involving the brain and an external medium, and to estimate and control the functional state of the central nervous system. A.B.K.

A70-38219 # An electronic differentiator for physiological studies (Elektronnyi differentsiator dlia fiziologicheskikh issledovani). V. L. Utkin. In: Methods of collecting and analyzing physiological data (Metody sbora i analiza fiziologicheskoi informatsii). (A70-38206 19-05) Edited by M. V. Radzinskaia. Moscow, Izdatel'stvo Nauka, 1969, p. 266-272. In Russian.

Description of an electronic differentiator designed for use at medical research institutes. The proposed differentiator ensures reproduction of the first and second derivatives of an electrical voltage ranging from 0 to 160 Hz with an error no greater than 5% in the case of first derivatives and no greater than 15% in the case of second derivatives, with a sensitivity of 30 v/sec and 5 v/sec per sec, respectively, and an input resistance of no less than 30 kohms. A.B.K.

A70-38220 # A device for determining the stability of standing and support reactions in humans (Pribor dlia opredeleniia ustoichivosti stoianii i opornykh reaktsii cheloveka). A. B. Venediktov, Iu. V. Terekhov, and M. I. Tishchenko. In: Methods of collecting and analyzing physiological data (Metody sbora i analiza fiziologicheskoi informatsii). (A70-38206 19-05) Edited by M. V. Radzinskaia. Moscow, Izdatel'stvo Nauka, 1969, p. 281-288. 6 refs. In Russian.

Description of a device, called a stabilograph and support dynamograph, for determining standing stability in humans. The proposed device consists of a sensor, a recording unit with amplifiers, and a power supply unit and operates according to the principle of

amplitude modulation of the carrier frequency. A characteristic stabilogram of a healthy subject is presented, and certain basic parameters of human body oscillations are summarized. A.B.K.

A70-38306 # The effect of defined asphyxias on neuronal action potential sequences in rats given artificial respiration (Über den Einfluss definierter Asphyxien auf neuronale Aktionspotentialfolgen bei künstlich beatmeten Ratten). U. Zwiener (Nervenklinik, Erfurt, East Germany) and H. Wenthin. *Acta Biologica et Medica Germanica*, vol. 24, no. 4, 1970, p. 549-552. 12 refs. In German.

Study of action potentials of thalamic neurons under asphyxia taking also into consideration the causes for the observed patterns. The extracellular 'spontaneous' sequences of action potentials of neurons in thalamic regions of 51 curarized Wistar rats, which were given artificial respiration, were derived making use of methods reported by Zwiener et al. (1969), and Zwiener and Davidowa (1969). The EKG, the pulse rate, and the rectal temperature were also obtained. Asphyxias from 5 to 60 sec were produced. G.R.

A70-38309 Laser hazard to the human eye (Die Gefährdung des menschlichen Auges durch Laser). E. Kaufmann (Schweizerische Unfallversicherungsanstalt, Lucerne, Switzerland. *Schweizer Archiv*, vol. 36, July 1970, p. 211-218. In German.

Examination of the hazardous effects of a direct helium-neon laser beam to human retina. Following a brief review of the various present-time laser types, the laser beam intensity as a function of the distance, and the laser beam absorption is considered. Particular attention is given to the laser beam intensity on human retina. The radiant energy absorption and the temperature increase in the retina is then examined, and the hazardous critical values are determined. It is shown that lasers can be hazardous to the human eye, which primarily applies to He-Ne lasers if the beam can directly enter the eye. The dangerous effect depends mostly on the distance of the beam source. The use of telescopes decreases but does not eliminate the danger. A much safer protection can be achieved by using protection glasses, the transmission factor of which must be specified according to the type and configuration of the laser used. O.H.

A70-38310 Attention and performance III; Proceedings of a Symposium, Soesterberg, Netherlands, August 4-8, 1969. Symposium sponsored by the Institute for Perception RVO-TNO. Edited by A. F. Sanders (Institute for Perception RVO-TNO, Soesterberg, Netherlands). Amsterdam, North-Holland Publishing Co., 1970. 440 p. \$19.50.

#### Contents:

Preface. A. F. Sanders (Institute for Perception RVO-TNO, Soesterberg, Netherlands), p. V.

The effect of preceding and following auditory stimuli on response times to visual stimuli. R. S. Nickerson (Bolt Beranek and Newman, Inc., Cambridge, Mass.), p. 5-20. 15 refs. (See A70-38311 19-04)

Can we see and hear at the same time - Some recent studies of intersensory facilitation of reaction time. I. H. Bernstein (Texas, University, Arlington, Tex.), p. 21-35. 14 refs. (See A70-38312 19-04)

An elementary preliminary taxonomy for some errors in laboratory choice RT tasks. P. M. A. Rabbitt and S. M. Vyas (Oxford University, Oxford, England), p. 56-76. 11 refs. (See A70-39313 19-04)



The organization of component decisions in visual search. P. K. Lehtiö (Turku, University, Turku, Finland), p. 93-105. 11 refs. (See A70-38314 19-04)

Towards a quantitative theory of attention. N. Moray (Sheffield, University, Sheffield, England), p. 111-117. 5 refs. (See A70-38315 19-04)

Remarks on attention control. D. Kahneman (Cambridge University, Cambridge, England; Hebrew University, Jerusalem, Israel), p. 118-131. 42 refs. (See A70-38316 19-04)

Recognition and the direction of attention. J. Brown (Bristol, University, Bristol, England), p. 149-157. 6 refs. (See A70-38317 19-04)

Evoked potential, EEG, and slow potential correlates of selective attention. R. Näätänen (Helsinki, University, Helsinki, Finland), p. 178-192. 24 refs. (See A70-38318 19-04)

Multiple probability learning - Associating events with their probabilities of occurrence. C. A. J. Vlek (Leiden, Rijksuniversiteit, Leiden, Netherlands), p. 207-232. 59 refs. (See A70-38319 19-04)

Acquisition and performance as a function of uncertainty and structure in serial tracking tasks. D. Trumbo (Pennsylvania State University, University Park, Pa.), p. 252-266. 8 refs. (See A70-38320 19-04)

On selection in visual immediate memory. J. M. von Wright (Turku, University, Turku, Finland), p. 280-292. 11 refs. (See A70-38321 19-04)

Comments on the information structure of memory. D. A. Norman (California, University, La Jolla, Calif.), p. 293-303. 19 refs. (See A70-38322 19-04)

Influence of display, task, and organismic variables on indices of monitoring behavior. M. Loeb and E. A. Alluisi (Louisville, University, Louisville, Ky.), p. 343-366. 110 refs. (See A70-38323 19-04)

Vigilance - A paradigm and some physiological speculations. H. J. Jerison (California, University, Los Angeles, Calif.), p. 367-380. 18 refs. (See A70-38324 19-04)

Effects of noise on arousal level in auditory vigilance. E. Gulian (Institute of Psychology, Bucharest, Romania), p. 381-393. 21 refs. (See A70-38325 19-04)

Author index, p. 433-440.

Subject index, p. 441, 442.

**A70-38311 \*** The effect of preceding and following auditory stimuli on response times to visual stimuli. Raymond S. Nickerson (Bolt Beranek and Newman, Inc., Cambridge, Mass.). In: Attention and performance III; Proceedings of a Symposium, Soesterberg, Netherlands, August 4-8, 1969. (A70-38310 19-04) Symposium sponsored by the Institute for Perception RVO-TNO. Edited by A. F. Sanders. Amsterdam, North-Holland Publishing Co., 1970, p. 5-20. 15 refs. Contract No. NAS 2-5108.

The S's task was to respond as quickly as possible to a visual stimulus that could either precede or follow an auditory stimulus by a variable interval. The locus of interest was the response time (RT) to the visual stimulus as a function of the interstimulus interval (ISI). Both the occurrence of the tone and the possibility of its occurrence had an effect on RT to the light. The effect of the occurrence of the tone was considered to be facilitative, the degree of facilitation increasing, to a point, with the duration of the tone-light interval. Some facilitation apparently occurred even when the light preceded the tone providing the interval was sufficiently brief. The problem of identifying an appropriate reference against which to judge whether responses are delayed or facilitated is discussed, and an ad hoc energy-summation model of intersensory facilitation is developed.

(Author)

**A70-38312** Can we see and hear at the same time - Some recent studies of intersensory facilitation of reaction time. Ira H. Bernstein (Texas, University, Arlington, Tex.). In: Attention and performance III; Proceedings of a Symposium, Soesterberg,

Netherlands, August 4-8, 1969. (A70-38310 19-04) Symposium sponsored by the Institute for Perception RVO-TNO. Edited by A. F. Sanders. Amsterdam, North-Holland Publishing Co., 1970, p. 21-35. 14 refs. NIH-supported research.

Study of the phenomenon of an intersensory facilitation of reaction time in terms of the single channel theories of attention and human performance. Two logically independent models are proposed for explaining the finding that the visual reaction time is facilitated by a simultaneous or near simultaneous auditory event. The first, or energy integration model, assumes that stimulus intensities may add across modalities causing the joint event to be effectively stronger than the visual event alone. The second, or preparatory state model, assumes that response preparation, defined as generalized disposition to make an overt response regardless of the specific nature of the response, may proceed in parallel with specific stimulus and response selection and may be initiated by nonattended stimuli. Z.W.

**A70-38313** An elementary preliminary taxonomy for some errors in laboratory choice RT tasks. P. M. A. Rabbitt and S. M. Vyas (Oxford University, Oxford, England). In: Attention and performance III; Proceedings of a Symposium, Soesterberg, Netherlands, August 4-8, 1969. (A70-38310 19-04) Symposium sponsored by the Institute for Perception RVO-TNO. Edited by A. F. Sanders. Amsterdam, North-Holland Publishing Co., 1970, p. 56-76. 11 refs.

A model derived from demonstrations of speed-error trade-off in choice RT experiments (Schouten and Bekker, 1967; Rabbitt, 1969a) is discussed as an explanatory basis for all types of error in all choice RT tasks. This discussion is conducted in the context of a preliminary taxonomy of errors distinguishing errors of perceptual discrimination from three types of errors in the selection and execution of responses (i.e., motor sequence programming errors, motor set errors and motor confusion errors). It is clear that speed-error trade-off functions differ between these classes of errors. It must be concluded that while speed-error trade-off functions allow detailed analysis of sequential operations between perceptual discrimination and response selection within individual tasks, they do not provide a valid means of distinguishing between performance in different tasks. The constraints and the advantages implicit in the use of such functions are further discussed. (Author)

**A70-38314** The organization of component decisions in visual search. Pekka K. Lehtiö (Turku, University, Turku, Finland). In: Attention and performance III; Proceedings of a Symposium, Soesterberg, Netherlands, August 4-8, 1969. (A70-38310 19-04) Symposium sponsored by the Institute for Perception RVO-TNO. Edited by A. F. Sanders. Amsterdam, North-Holland Publishing Co., 1970, p. 93-105. 11 refs. Research supported by the National Research Council for the Social Sciences and the Foundation of Jenny and Antti Wihuri.

Three experiments are reported. They represent an effort to analyze the logical and temporal arrangement of component decisions in stimulus classification, when the target is defined by a combination of values of several attributes. Relative frequencies of values of each attribute are manipulated to provide information about the way in which the subject performs component decisions. The results support a serial/self-terminating/fixed order type of model, in which the order can be manipulated by differential training. (Author)

**A70-38315** Towards a quantitative theory of attention. Neville Moray (Sheffield, University, Sheffield, England). In: Attention and performance III; Proceedings of a Symposium, Soesterberg, Netherlands, August 4-8, 1969. (A70-38310 19-04) Symposium

sponsored by the Institute for Perception RVO-TNO. Edited by A. F. Sanders. Amsterdam, North-Holland Publishing Co., 1970, p. 111-117. 5 refs.

This paper discusses the logic of experimental designs for work on attention, and outlines the steps required to put work on attention on a quantitative rather than a qualitative footing. A logical description is developed from which it is very easy to derive systematic control experiments, and deduce interrelationships among several kinds of experiments on attention. (Author)

**A70-38316**      **Remarks on attention control.** Daniel Kahneman (Cambridge University, Cambridge, England; Hebrew University, Jerusalem, Israel). In: Attention and performance III; Proceedings of a Symposium, Soesterberg, Netherlands, August 4-8, 1969. (A70-38310 19-04) Symposium sponsored by the Institute for Perception RVO-TNO. Edited by A. F. Sanders. Amsterdam, North-Holland Publishing Co., 1970, p. 118-131. 42 refs.

Some recent trends in studies on optimality in the allocation of attention and on determinants of attentional performance are discussed, and brief reports of some new experiments are given. The discussion of allocation includes resistance to distraction and performance in multiple tasks. It is suggested that optimal allocation of attention is often achieved in both types of task. As to the determinants of attentional performance, the role of spatial orientation is discussed and comments are given on the results of experiments on shadowing. (Author)

**A70-38317**      **Recognition and the direction of attention.** John Brown (Bristol, University, Bristol, England). In: Attention and performance III; Proceedings of a Symposium, Soesterberg, Netherlands, August 4-8, 1969. (A70-38310 19-04) Symposium sponsored by the Institute for Perception RVO-TNO. Edited by A. F. Sanders. Amsterdam, North-Holland Publishing Co., 1970, p. 149-157. 6 refs.

Description of four related experiments in which evidence was sought for the hypothesis that the mechanism of attention enables unwanted inputs to be attenuated. In the experiments described, a single pair of words was presented, one to each ear. Thus, provided a word was identified, it should have been remembered without difficulty. Steps were taken to try to ensure that if a word was not identified at the time of presentation, there would be information-loss in storage. The task was to select the word presented to a designated ear in a recognition test immediately following presentation. In the test, both the words presented, plus a new word, were shown on a card. The side on which they were typed defined which word was correct - e.g., if they were on the left, then the task was to select the word which was presented to the left ear. Two conditions were compared. Under one condition, the subject knew in advance which ear would be critical. Under another condition, he discovered which ear was critical only when he saw the recognition card. Negative results were obtained. Various explanations for this failure to find evidence for the attenuation hypothesis are briefly discussed. One is consistent with a subsidiary finding that words were tagged effectively by ear-of-arrival and a further experiment to test this hypothesis is suggested. Z.W.

**A70-38318 \***      **Evoked potential, EEG, and slow potential correlates of selective attention.** Risto Näätänen (Helsinki, University, Helsinki, Finland). In: Attention and performance III; Proceedings of a Symposium, Soesterberg, Netherlands, August 4-8, 1969. (A70-38310 19-04) Symposium sponsored by the Institute for Perception RVO-TNO. Edited by A. F. Sanders. Amsterdam, North-Holland Publishing Co., 1970, p. 178-192. 24 refs. NSF Grant No. GB-1844; Grant No. NSG-623.

Description of an experiment for clarifying the interpretation of

enhanced evoked potentials elicited by stimuli relevant to the task at hand, reported in recent studies on the neurophysiological basis on selective attention. The hypothesis was proposed that it is the regular presentation of relevant and irrelevant stimuli which is the crucial factor in inducing evoked potential amplitude enhancements, not selective attention as thought by many investigators. Five subjects were studied. Auditory stimuli were delivered, and every second click was made relevant by means of a rather difficult discrimination task. Evoked potentials were recorded over the occipital, vertex, and temporal area of the cortex. The background EEG and slow potentials were also measured. The results indicated that under conditions in which the delivery of the relevant stimuli can be quite accurately anticipated, two of the five subjects showed, before relevant, but not irrelevant, stimuli, both a widespread decrease in the EEG amplitude and a large negative phase of the slow potential. It is suggested that the real reason for the enhanced amplitudes of potentials elicited by the relevant stimuli is the increased nonspecific cortical activation preceding these stimuli. The nonspecificity of this activation is indicated by the finding that also the occipital area was more activated when the subject heeded auditory stimuli than when he did not do so. Z.W.

**A70-38319**      **Multiple probability learning - Associating events with their probabilities of occurrence.** Charles A. J. Vlek (Leiden, Rijksuniversiteit, Leiden, Netherlands). In: Attention and performance III; Proceedings of a Symposium, Soesterberg, Netherlands, August 4-8, 1969. (A70-38310 19-04) Symposium sponsored by the Institute for Perception RVO-TNO. Edited by A. F. Sanders. Amsterdam, North-Holland Publishing Co., 1970, p. 207-232. 59 refs.

Experimental-psychological study of the ability of subjects to learn the association between an event and its probability of occurrence. It is shown that in the predecisional stage of information processing subjects often revise prior probabilities of several hypotheses on the basis of sample information. The familiar two-choice probability learning experiments are first considered; it is shown that they do not provide much information about the manner in which subjects learn probability of events, mainly because the results of both perceptual learning and decision processes are confounded in the subject's prediction response. This classical two-choice paradigm is then extended to more than two alternatives and to values of a continuous variable, i.e., to multiple probability learning. The results, however, often suffer from the same weakness although sometimes response proportions and subjective probability estimates were collected simultaneously, indicating that they are fundamentally different dependent variables. The problem of measuring subjective probabilities is briefly discussed and some suggestions are made concerning research still to be done. O.H.

**A70-38320**      **Acquisition and performance as a function of uncertainty and structure in serial tracking tasks.** Don Trumbo (Pennsylvania State University, University Park, Pa.). In: Attention and performance III; Proceedings of a Symposium, Soesterberg, Netherlands, August 4-8, 1969. (A70-38310 19-04) Symposium sponsored by the Institute for Perception RVO-TNO. Edited by A. F. Sanders. Amsterdam, North-Holland Publishing Co., 1970, p. 252-266. 8 refs. NSF Grant No. GB-6775.

Criterion performance and response organization were evaluated in skilled tasks involving the pursuit tracking of step-function inputs. Both the structure and degree of first-order sequential dependencies among target events were manipulated in a factorial design. Tracking error was found to be a function of the degree of uncertainty and of the task structure (one vs two low-probability sequential alternatives) and the latter could not be attributed to the degree of uncertainty, per se. Furthermore, detailed analysis of continuous response records

revealed differences in response strategies as a function of task structure. These differences accounted, in part, for difference in tracking performance and discrepancies between the present and prior research. (Author)

**A70-38321** On selection in visual immediate memory. J. M. von Wright (Turku, University, Turku, Finland). In: Attention and performance III; Proceedings of a Symposium, Soesterberg, Netherlands, August 4-8, 1969. (A70-38310 19-04) Symposium sponsored by the Institute for Perception RVO-TNO. Edited by A. F. Sanders. Amsterdam, North-Holland Publishing Co., 1970, p. 280-292. 11 refs. Research supported by the National Research Council for the Social Sciences, the Foundation of Signe and Ane Gyllenberg, and the Foundation of Jenny and Antti Wilhuri.

The efficiency of the selection of items from visual immediate memory (sensory storage) according to different criteria was studied. Selection on the basis of simple and general physical characteristics was efficient; the greater the number of distinctive features to be taken into account, and the less the discriminability between or the uniformity within the categories to be distinguished, the more difficult was selection. The level of performance was determined mainly by the efficiency (speed) of the selection process, and was comparatively independent of stimulus characteristics which, though they had to be processed and reported, did not affect selection. The results are in agreement with serial models of information processing. The retention of rejected items is discussed. (Author)

**A70-38322** Comments on the information structure of memory. Donald A. Norman (California, University, La Jolla, Calif.). In: Attention and performance III; Proceedings of a Symposium, Soesterberg, Netherlands, August 4-8, 1969. (A70-38310 19-04) Symposium sponsored by the Institute for Perception RVO-TNO. Edited by A. F. Sanders. Amsterdam, North-Holland Publishing Co., 1970, p. 293-303. 19 refs. NIH Grant No. NB-07454-03.

Human memory is used in many different ways for many different tasks. By studying the various uses of memory we can learn about its properties. Pattern recognition requires efficient use of contextual information and previously learned information. The evidence from experiments on simultaneous attention leads us to a similar conclusion: we need a combination of active and passive analyzing systems and a memory system based on a sensory addressable stage. The search of long-term memory has many aspects of a problem-solving task. We find strategies and logic playing as important a role as the actual information that can be retrieved. The memory requirements seem to imply that the memory addressing scheme should be one that is content addressable. (Author)

**A70-38323** Influence of display, task, and organismic variables on indices of monitoring behavior. Michel Loeb and Earl A. Alluisi (Louisville, University, Louisville, Ky.). In: Attention and performance III; Proceedings of a Symposium, Soesterberg, Netherlands, August 4-8, 1969. (A70-38310 19-04) Symposium sponsored by the Institute for Perception RVO-TNO. Edited by A. F. Sanders. Amsterdam, North-Holland Publishing Co., 1970, p. 343-366. 110 refs. Grant No. DA-HC-19-69-C-0009.

Review of the effects of three principal groups of variables that, in the light of recent findings, influence monitoring behavior. The following groups are considered: display variables that include the physical characteristics of the signal and signal-bearing display, categorized into temporal, spatial, and conspicuity factors; task variables including both physical and other nondisplay features of the watchkeeping task, e.g., S-R compatibility, additional task loadings, and environmental factors; and, finally, organismic variables that include those characteristics of the subject which influence his

monitoring behavior, such as drug effects, diurnal or circadian cycle effects, sleep and rest, knowledge of results and other incentives, impersonal interactions, and personality differences. It is suggested that all of these variables have merit in explaining some of the data and that none of them can satisfactorily explain all of them. O.H.

**A70-38324** Vigilance - A paradigm and some physiological speculations. Harry J. Jerison (California, University, Los Angeles, Calif.). In: Attention and performance III; Proceedings of a Symposium, Soesterberg, Netherlands, August 4-8, 1969. (A70-38310 19-04) Symposium sponsored by the Institute for Perception RVO-TNO. Edited by A. F. Sanders. Amsterdam, North-Holland Publishing Co., 1970, p. 367-380. 18 refs. Research supported by the State of California Department of Mental Hygiene and the University of California; PHS Grant No. HD-04612.

The paradigm followed in experiments on human vigilance is discussed in detail to show relationships between vigilance, signal-detection, and animal discrimination experiments. Parts of the paradigm involve 'observing response' and 'decision whether stimulus is signal' as hypothetical constructs, and suggestions from the literature on electroencephalography are developed to convert these to empirical constructs. Specifically, an early potential (100-200 msec latency) of the averaged evoked response may correspond to the observing response, and a late potential (350-600 msec latency) may be related to the way the observer decides whether or not a stimulus is a signal. (Author)

**A70-38325** Effects of noise on arousal level in auditory vigilance. Edith Gulian (Institute of Psychology, Bucharest, Romania). In: Attention and performance III; Proceedings of a Symposium, Soesterberg, Netherlands, August 4-8, 1969. (A70-38310 19-04) Symposium sponsored by the Institute for Perception RVO-TNO. Edited by A. F. Sanders. Amsterdam, North-Holland Publishing Co., 1970, p. 381-393. 21 refs.

Changes in arousal level (cerebral reactivity) expressed through EEG parameters were followed up simultaneously with performance in auditory signal detection under different noise conditions. It was stated that Ss differ in respect to their cerebral reactivity, ranging in a continuum from hyperreactivity to hyporeactivity. Exposure to noise elicits alterations in arousal level; hyporeactive Ss are aroused, whereas the hyperreactive Ss are de-aroused. Statistically significant differences were found between number of omissions of the two groups under most experimental conditions. Number of detections varied only slightly in hyporeactives, but described an inverted-U relation as a function of noise in hyperreactives. (Author)

**A70-38361** Thermographic patterns of angina pectoris. Constantine Potanin, David Hunt, and L. Thomas Sheffield (Alabama, University, Birmingham, Ala.). *Circulation*, vol. 42, Aug. 1970, p. 199-204. 12 refs. PHS Grant No. PH 43-67-1441.

Liquid crystals, encapsulated onto black Mylar tapes, were used as cutaneous temperature sensors in 50 male patients, who had thermographic examinations while they were being exercised on the treadmill, in an attempt to induce angina pectoris. Twenty-eight of the group remained free of pain and the exercise thoracic thermogram was essentially unchanged from the control or resting state. Twenty-two patients developed angina pectoris during exercise, of whom 21 had associated ST depression in the electrocardiogram, and 17 thermographic abnormalities. When the pain was unilateral (nine patients), skin coolness was invariable and was within the distribution of the pain. When the pain was central (13 patients), skin coolness was present in some of the patients (eight of 13) and was not always within the area of pain. When present, the skin coolness was transient and settled within minutes of relief of pain. (Author)

**A70-38362** Comparative quantitative analysis of the electrocardiogram and the vectorcardiogram - Correlations with the coronary arteriogram. David R. McConahay, Ben D. McCallister, Franz J. Hallermann, and Ralph E. Smith (Mayo Clinic and Mayo Foundation; Minnesota, University, Rochester, Minn.). *Circulation*, vol. 42, Aug. 1970, p. 245-259. 33 refs.

Study designed to compare the results of an electrocardiogram (ECG) analysis using criteria applied to manual measurements and a vector-cardiogram (VCG) analysis using criteria applied to discrete voltage data derived from a computer program. It was found that the frequency of ECG and VCG evidence of 'definite' myocardial infarction (MI) increased as the extent of significant arteriographic disease increased. The VCG was diagnostic of MI in a greater number of patients than the ECG and excelled in the detection of multiple areas of infarction in a greater number of patients. This increased sensitivity was gained in anterior, inferior, and true posterior infarcts. Quantitative VCG analysis appears superior to the usual ECG analysis in the accurate detection of MI. G.R.

**A70-38366** The rate of the chloride shift of respiration studied with a rapid filtration method. Allen Hemingway, Claire J. Hemingway, and F. J. W. Roughton (Cambridge University, Cambridge, England; California, University, Los Angeles, Calif.). *Respiration Physiology*, vol. 10, July 1970, p. 1-9. 19 refs. PHS-supported research.

The chloride shift of respiration which occurs between plasma and erythrocytes when carbon dioxide enters or leaves the blood has been studied with the Hartridge-Roughton rapid reaction method adapted for filtration. It has been found that after mixing erythrocytes with glucose-Ringer-Locke solution exposed to one atmosphere of carbon dioxide the chloride in the extracellular fluid decreased irregularly due to the chloride shift. In some instances a transitory elevation of chloride (reversal of shift) occurs indicating a second reaction superimposed on the shift. An estimate of the half-time of the shift is 138 msec. Acetazolamide reduces these reactions. The membrane ionic exchange of chloride with bicarbonate ions has a rapid and slowly diffusing phase. (Author)

**A70-38367** Reduction of the carbon dioxide affinity of human haemoglobin solutions by 2,3 diphosphoglycerate. Christian Bauer (Hannover, Medizinische Hochschule, Hannover, West Germany). *Respiration Physiology*, vol. 10, July 1970, p. 10-19. 23 refs.

The CO<sub>2</sub> content of dialyzed solutions of human haemoglobin has been measured at a carbon dioxide pressure of 40 mm Hg and varying pH values without and with added 2,3 diphosphoglycerate (2,3 DPG). It has been found that 2,3 DPG reduces the CO<sub>2</sub> affinity of deoxygenated haemoglobin. The decreased CO<sub>2</sub> content in oxygenated haemoglobin solutions compared with deoxygenated haemoglobin at the same pH and carbon dioxide pressure could be established only in the absence of 2,3 DPG. Haemoglobin solutions containing 2,3 DPG showed an even higher CO<sub>2</sub> affinity of oxygenated haemoglobin compared with deoxygenated haemoglobin. The Bohr effect, when measured as equivalents OH<sup>-</sup>/heme released from haemoglobin upon deoxygenation at a constant carbon dioxide pressure and pH was lower in the absence than in the presence of 2,3 DPG. It is suggested that the binding of 2,3 DPG to deoxygenated haemoglobin interferes with the carbamate formation at the terminal amino groups of the beta-chain. The physiological implications of these results for the CO<sub>2</sub> transport and exchange are discussed. (Author)

**A70-38368 \*** Dynamic intravascular pressures in the microvessels of the frog lung. J. E. Maloney and B. L. Castle (NASA, Ames Research Center, Biotechnology Div., Moffett Field, Calif.). *Respiration Physiology*, vol. 10, July 1970, p. 51-63. 16 refs.

Dynamic intravascular pressures were measured directly in the small vessels of the frog lung by inserting a small (0.5 micron tip) micropressure transducer into the vessel lumen. The major drop in mean pressure occurred in the larger arterial vessels across the capillary plexus and in the veins. When left atrial pressure was less than alveolar pressure and the mean pulmonary artery pressure was 11.7 cm water, the arteries, capillaries and veins contributed 15.6%, 16.2% and 68.2% to the total pressure drop while at a mean pulmonary artery pressure of 29.3 cm water the corresponding figures were 27.9%, 21.8% and 50.5%. Virtually no pressure drop was seen in arterial vessels between 567 and 80 microns in diameter. The major sites of attenuation of the pulmonary arterial pressure pulse were the larger arteries and the capillary plexus. At all pulmonary artery pressures examined the pulse amplitude was reduced by approximately 40% in arterial vessels greater than 567 microns in diameter and by approximately 27% across the capillary plexus. These results indicate that the contribution of the various segments of the pulmonary circulation to the total vascular resistance depends on the pulmonary artery pressure or flow, and that the attenuation of the pulmonary artery pressure pulse is independent of these factors. (Author)

**A70-38369** Effect of oxygen at high pressure at rest and during severe exercise. E. W. Banister, J. E. Taunton, T. Patrick, P. Oforsagd, and W. R. Duncan (Simon Fraser University, Burnaby; British Columbia, University, Vancouver, British Columbia, Canada). *Respiration Physiology*, vol. 10, July 1970, p. 74-84. 17 refs. Research supported by the Simon Fraser University and the British Columbia Heart Foundation.

Comparison of the effect of prolonged hyperbaric 100% oxygen breathing on physical performance with performance under normal atmospheric conditions. Two subjects (one an active athlete) performed severe exercise (1500 kg-m/min) either while breathing normal air or oxygen at 2 atmospheres absolute pressure. Varied sequences of breathing either air or oxygen were arranged. Metabolic acidosis in oxygen was reduced for the same exercise in both subjects compared to normal air. This effect persisted for exercise in air after breathing oxygen for a long period and was more definite in the trained athlete than the other subject. Exercise hyperpnea was reduced in oxygen and in air exercise after long oxygenation compared to normal air. The maximum exercise heart rate was reduced in oxygen but unaltered for any condition of air breathing whether or not preceded by oxygenation. Arterial hypocapnia occurred at rest breathing oxygen and a relative hypercapnia was apparent in oxygen after exercise. A large resting inspired-arterial oxygen tension difference developed in oxygen becoming larger during the course of oxygenation. Oxygen uptake and carbon dioxide elimination in air after oxygenation were depressed. These changes are attributed to the variation in relative importance of high arterial and tissue oxygen tension during oxygenation and the possible toxic effects of oxygen on enzyme systems in glycolysis which remain unaffected by air breathing exercises after long oxygenation. M.V.E.

**A70-38370** The perception of some sensations associated with breathing. J. H. C. M. Bakers and S. M. Tenney (Dartmouth College, Hanover, N.H.). *Respiration Physiology*, vol. 10, July 1970, p. 85-92. 10 refs. NIH Grant No. HE-02888(14).

The ability to estimate several sensations associated with breathing was studied in man by comparing physical stimulus intensity with the subject's judgment of magnitude. The data were expressed by the psychophysical power law in which apparent, or psychological magnitude is equal to K times the physical or real stimulus intensity to the n-th power. K and n are constants. The group mean value of n for pressure stimuli was about 1.5; for volume, about 1.3; and for ventilation, about 1.9. Refinements in experimental design to separate 'active' (i.e., subject generated stimulus by his own motor function) as compared with 'passive'

(observer generated stimulus) did not reveal significant differences in manner of assessment of pressure or volume (criterion was value of n), nor were pressure assessments of either kind affected by lung volume. The origin of the sensations probably resides in the chest wall. (Author)

**A70-38371 Reliability of blood CO<sub>2</sub> pressure measurements by the CO<sub>2</sub>-electrode, the whole-blood C sub CO<sub>2</sub>/pH method and the Astrup method.** F. Bärtschi, P. Haab, and D. R. Held (Fribourg, Université, Fribourg, Switzerland). *Respiration Physiology*, vol. 10, July 1970, p. 121-131. 28 refs. Fonds National Suisse de la Recherche Scientifique Grants No. 2718; No. 4846.

The reliability of three methods commonly used for blood CO<sub>2</sub> pressure measurements (CO<sub>2</sub>-electrode, whole-blood sub CO<sub>2</sub>/pH method, Astrup method) was evaluated by analysis of human blood samples tonometered at known CO<sub>2</sub> pressures. CO<sub>2</sub> pressure was in the physiological region (38-53 mm Hg). The CO<sub>2</sub>-electrode yielded the most satisfactory results (smallest scatter, no directional error). The whole-blood sub CO<sub>2</sub>/pH method was likewise devoid of directional error, but its scatter was appreciably larger. The Astrup method showed, along with an intermediate scatter, a desaturation-dependent systematic error. This error could be attributed to two factors affecting the desaturation correction: (1) the presence of small but not negligible amounts of nonoxygenable Hb in the samples, and (2) an overestimation of the Haldane effect in terms of BB change. (Author)

**A70-38372 \* Long-term numerical recording of very small oxygen consumptions under sterile conditions.** A. A. Heusner (California, University, Davis, Calif.). *Respiration Physiology*, vol. 10, July 1970, p. 132-150. 35 refs. Grant No. NsG-721.

A coulometric microrespirometer is described. A differential manometer detects the volume variation in the respiratory chamber; its manometric liquid, a copper sulfate solution, rises until the solution touches a platinum electrode inside the limb connected to the respiratory chamber. Then a capacitor is discharged through the copper sulfate solution and a constant amount of oxygen is set free by electrolysis. The capacitor is automatically recharged and discharged as long as the liquid remains in contact with the electrode. The number of discharges necessary to replace the consumed oxygen is recorded at regular time intervals. The volume of oxygen released per discharge may be continuously adjusted from 0.001 to 0.05 microliter so that the relative counting error is kept constant over a wide range of oxygen consumptions. The production of oxygen within the respiratory chamber permits a sterile maintenance of precise partial pressures of oxygen during long-term experiments. (Author)

**A70-38375 \* Further studies on regulation of betacyanin efflux from beetroot tissue - Ca-ion-reversible effects of hydrochloric acid and ammonia water.** S. M. Siegel (Hawaii, University, Honolulu, Hawaii). *Physiologia Plantarum*, vol. 23, 1970, p. 251-257. 9 refs. Grant No. NGR-12-001-042.

Study of the Ca-ion reversible effects of aqueous NH<sub>3</sub> and NaCl on betacyanin leakage from beetroot sections as simple models for complex polycations such as polylysines. From kinetic evidence, competitive character of Ca-ion antagonism in all these cases, and general chemical arguments, it is suggested that ammonia, hydrogen chloride and polylysine all act as sources of H<sub>3</sub>O ions which can compete with the Ca-ion for electronegative sites on the membrane. The Ca-reversibility of alcohol-induced leakage is then explained as a lowering of dielectric constant at the membrane resulting in reduced charge at electronegative sites with concomitant loss of ion binding capacity. Biological illustration of the antagonism between Ca-ion and ammonia, and of H-ion-dependent NaCl sensitivity are presented. Z.W.

**A70-38409 Recent work on the adaptive functions of circadian and seasonal rhythms in animals.** J. L. Cloudsley-Thompson (Khartoum, University, Khartoum, Sudan). *Journal of Interdisciplinary Cycle Research*, vol. 1, May 1970, p. 5-19. 80 refs.

Review of research published on biological clocks since 1960. It is pointed out that, despite annual increases in the quantity of research which have appeared since then, knowledge of the fundamental physiology of rhythms has progressed relatively little. There has, however, been further evidence for the role of circadian rhythms in relation to physical factors of the terrestrial environment. M.M.

**A70-38410 Circadian rhythms in single cell animals (Les rythmes circadiens chez les unicellulaires).** Thérèse Vanden Driessche (Bruxelles, Université Libre, Brussels, Belgium). *Journal of Interdisciplinary Cycle Research*, vol. 1, May 1970, p. 21-42. 65 refs. In French. EURATOM-supported research.

Discussion of the influence of various factors on circadian rhythms in unicellular animals. It is pointed out that new tests are necessary to determine whether in *Acetabularia* and *Gonyaulax* there are one or several basic oscillating systems because, if a phase difference does not at all entail different oscillators, this phase difference does not warrant the conclusion of the existence of several mechanisms. Unicellular animals present a precise temporal structure. They make it possible to advance the knowledge of the subtle molecular equilibrium which governs so many functions. M.M.

**A70-38411 Axiomatic approach to homeostasis (Une approche axiomatique de l'homéostasie).** B. Rybæk (Caen, Université, Caen, France). *Journal of Interdisciplinary Cycle Research*, vol. 1, May 1970, p. 43-47. 11 refs. In French.

Description of an axiomatic approach to homeostasis. It is pointed out that living systems are sustained, even forced, oscillators maintained by input-output and transit variables in duration and elongation. Waller's curve of sines - an ideal rhythmic function of living processes - defines a nonlinear system, a point which makes the axiomatic analysis nonuniversal and restricts attempts to give a general algorithmic formalization of homeostasis. M.M.

**A70-38412 Problems in the statistical analysis of short periodic time series.** A. Sollberger (Yale University, New Haven, Conn.). *Journal of Interdisciplinary Cycle Research*, vol. 1, May 1970, p. 49-88. 78 refs. Research supported by the Vocational Rehabilitation Administration; NIH Grant No. MH-13917-02.

Discussion of very short records which are not uncommon in biological rhythm research, especially in medicine, covering only one cycle and with few sample points. After contrasting this with some rare examples of long time series, the main approaches to the analysis of short records are discussed. Fourier methods and other avenues are compared. The classical Fourier analysis is shown to be a special case of multiple regression, the latter must be used if the data are unequidistant. Comparisons are made on some model sines with varying amounts of noise added. The effect of spatial and temporal errors is discussed, and the effect of the successive addition of sine terms is investigated in an example from the seasonal temperature rhythm in rats. The relations between polynomial curve fitting and periodic regression are studied using the McLaurin expansion in connection with a discussion of period estimation. Some major methods currently being used are discussed, such as the cosinor, periodic regression, and progressive harmonic analysis. The transient synchronization analysis for exploring biological synchronization is briefly dealt with. M.M.

**A70-38413 Aspects of intra-relevancies of photoperiodism - A review.** E. B. Hague and T. E. Hague. *Journal of Interdisciplinary Cycle Research*, vol. 1, May 1970, p. 89-93. 19 refs.

Survey of studies bearing on intrarelevant aspects of photoperiodism. It is noted that the retinal pigment epithelium which is capable of binding or collecting certain drugs may bind or collect other more physiological substances, including the photosensitive substance which mediates visual response, as well as the substance that mediates photoperiodic responses to light. Perhaps these two presumed substances are one and the same. DOPA accumulates in the retinal pigment epithelium when tyrosinase loses its phenolase activity while retaining its catecholase activity. This may be part of the mechanism whereby certain drugs affect retinal pigmentation.

M.M.

**A70-38414**      The medical importance of periodicity longer than the circadian rhythm. H. A. Reimann (Hahemann Medical College and Hospital, Philadelphia, Pa.). *Journal of Interdisciplinary Cycle Research*, vol. 1, May 1970, p. 101-103. 9 refs.

Discussion of a number of disparate, heritable diseases which affect otherwise healthy persons with episodes of illness repetitive for decades in precise or irregular rhythm of days, weeks or months. Cycles of that amplitude have received little biological or medical attention as compared with the broad interest in the circadian rhythm. It is pointed out that, until the cause and nature of underlying long rhythms in man are discovered, no specific therapy and, aside from eugenic means, no preventive measures are available.

M.M.

**A70-38504 #**      Investigations regarding the prediction of decisions (Untersuchungen über die Vorhersage von Entscheidungen). Hubert Feger (Bonn, Universität, Bonn, West Germany). *Zeitschrift für experimentelle und angewandte Psychologie*, vol. 17, 1st Quarter, 1970, p. 21-36. 15 refs. In German.

Discussion of an approach to the prediction of choices in decision-situations which are not repeatable or are only partially repeatable. The predictive power of this approach is tested in two independent studies and turns out to be satisfactory. The discussion concentrates on the reasons why this approach leads to good predictions and mentions the relationship to phenomenological analyses.

G.R.

**A70-38505 #**      Investigations regarding the Panum effect (Untersuchungen zum Panum-Effekt). Klaus Heinerth (Tübingen, Universität, Tübingen, West Germany). *Zeitschrift für experimentelle und angewandte Psychologie*, vol. 17, 1st Quarter, 1970, p. 52-68. 6 refs. In German.

Investigation of three psychological theories for explaining the Panum phenomenon. The theories considered are the classical projection theory, the theory of attraction and the figure-ground theory. It is found that the claim of each theory to substitute the previous one appears not to be justified. While the projection theory is generally valid, the other theories only have relative validity. The theory of attraction differs from the projection theory only in one more degree of freedom.

G.R.

**A70-38506 #**      Inter-individual differences in judging stimulus similarities (Interindividuelle Unterschiede bei der Beurteilung von Reizähnlichkeiten). Gerd Luer and Hartmut Fillbrandt (Kiel, Neue Universität, Kiel, West Germany). *Zeitschrift für experimentelle und angewandte Psychologie*, vol. 17, 1st Quarter, 1970, p. 123-138. 9 refs. In German.

Study of the possibility to explain the unsatisfactory results obtained through average scalings on the basis of the interindividual

differences in the procedure of judging. In an experiment 50 subjects were required to judge 10 stimuli shown in pairs with respect to their similarity. The subjects were divided into two groups making use of a method proposed by Tucker and Messick (1963) and of Tryon's cluster analysis (1939). The results of this procedure are discussed.

G.R.

**A70-38507 #**      Estimation of test validities at random samples with restricted variance taking into consideration the example of aircraft pilot aptitude tests (Schätzung von Testvaliditäten an Stichproben mit eingeschränkter Varianz am Beispiel von Flugzeugführer-Eignungstests). Harald Witt (Regensburg, Universität, Regensburg, West Germany). *Zeitschrift für experimentelle und angewandte Psychologie*, vol. 17, 1st Quarter, 1970, p. 158-181. 7 refs. In German. (DFVLR-SONDOR-41)

Discussion of the validity of aptitude tests taking into account the subjective decisions of a selection board on accepting or rejecting pilot applicants. These decisions are subsequently objectified by two different methods. In this way the conditions for applying corrective formulas are created, enabling the validities of selection tests to be estimated. The validities of the total sample are estimated from the validities of the nonrepresentative sample of the accepted applicants. It is shown that the test-weights implicitly used by the selection board greatly differed from the optimal weights. It is suggested that the results should be reviewed by way of a cross-validation.

G.R.

**A70-38575 \***      The circulatory response to lidocaine in experimental myocardial infarction. S. L. Robison, M. Schroll, and D. C. Harrison (Stanford University, Palo Alto, Calif.). *American Journal of the Medical Sciences*, vol. 258, Oct. 1969, p. 260-269. 22 refs. Research supported by the American Heart Association; NIH Grants No. HE-09058-05; No. HE-5709-03; No. HE-5107-14; Grant No. NGR-05-020-305.

Study of the hemodynamic effects of lidocaine given by infusion and as bolus injections to 19 anesthetized dogs before and after acute myocardial infarction produced by a two stage ligation of coronary arteries. Responses to infusion and injection before and after myocardial infarction are described in terms of effects on cardiac output, heart rate, and systolic left ventricular and aortic pressures. It is concluded that large doses of lidocaine given as a single injection can produce significant circulatory depression in a heart compromised by myocardial infarction.

T.M.

**A70-38647 #**      Management factors in reducing air traffic controller stress. Alton M. Waldin (FAA, Brussels, Belgium). In: Swedish Society of Aeronautics and Astronautics, International Symposium on Air Traffic Control, Stockholm, Sweden, March 12-14, 1969, Proceedings. (A70-38629 19-21) Stockholm, Swedish Society of Aeronautics and Astronautics, 1970, p. 321-328.

Discussion of the various management and human factors that affect the capacity of an air traffic control system, and of ways by which management can reduce air traffic controller stress. An air traffic controller is a psychomotor athlete possessing an unusually high level of developed perceptual, motor, and decision-making abilities. Like other athletes, he is subject to fatigue and cannot maintain his highest level of performance indefinitely. Maximum levels of safe productivity of air traffic control teams can be achieved by working controllers in relays with optimal work-rest intervals. The controller is subject to many stress-inducing factors, and management practices can increase or decrease the stress to which he is exposed. Stress on the controller can be reduced by increased staffing with proper allocation of rest periods during his shift. The present practice of rapid shift rotation is considered to be medically undesirable.

F.R.L.



**A70-38648 # Human factors in ATC.** V. D. Hopkin (RAF, Institute of Aviation Medicine, Farnborough, Hants., England). In: Swedish Society of Aeronautics and Astronautics, International Symposium on Air Traffic Control, Stockholm, Sweden, March 12-14, 1969, Proceedings. (A70-38629 19-21) Stockholm, Swedish Society of Aeronautics and Astronautics, 1970, p. 329-339, 341-344.

Discussion of the contribution which human factors as a discipline can make toward solving the ATC problems. The relationship between ATC and human factors is briefly examined. The application of human factors in a recent series of simulated simulation trials is described. In conclusion, certain impending problems in ATC systems are suggested which seem apparent to the human factors specialist. Z.W.

**A70-38649 # The air traffic controller in the future air traffic system.** Gunnar Atterholm (International Federation of Air Traffic Controllers Associations, East Twickenham, Middx., England). In: Swedish Society of Aeronautics and Astronautics, International Symposium on Air Traffic Control, Stockholm, Sweden, March 12-14, 1969, Proceedings. (A70-38629 19-21) Stockholm, Swedish Society of Aeronautics and Astronautics, 1970, p. 345-350.

Discussion of the role of the air traffic controller in the future air traffic system, taking into account the subjection of automation in the domain of operations and control. It is considered that, since electronic brains are incapable of doing more than they have been programmed to do by human brains, and cannot exercise the fine points of judgement and discretion required in exceptional contingencies, they must be regarded as auxiliary to, but no substitute for, the human operator. Pilots and controllers are in agreement that there is still a need for the man behind the microphone in the foreseeable future. F.R.L.

**A70-38650 # Training of ATC personnel for the new era.** Jacob Wachtel (Air Traffic Controllers Association of Israel, Lod Airport, Israel). In: Swedish Society of Aeronautics and Astronautics, International Symposium on Air Traffic Control, Stockholm, Sweden, March 12-14, 1969, Proceedings. (A70-38629 19-21) Stockholm, Swedish Society of Aeronautics and Astronautics, 1970, p. 351-356.

Suggestion of a new approach to the training of ATC personnel, namely, the establishment of an International ATC Academy. Seven objectives are set for this academy. The syllabus of the Academy would include aerodynamics, computers, ATC automation, navigation systems, ATC programming and management, radar, Link training, equipment maintenance, training for ATC instructors, applied mathematics, history of aviation, the three official languages, satellites in ATC, as well as basic and advanced ATC. M.M.

**A70-38723 # Some questions regarding the effect of ionizing radiation on the endocrine system and its part in radiation syndrome (Einige Fragen zur Wirkung der ionisierenden Strahlung auf das endokrine System und dessen Rolle beim Strahlensyndrom).** D. E. Grodzenskii (Akademiia Meditsinskikh Nauk SSSR, Moscow, USSR). (Symposium über Strahlenendokrinologie, Obninsk, USSR, May 24-27, 1967.) *Radiobiologia - Radiotherapia*, vol. 11, no. 2, 1970, p. 207-213. In German. (Translation).

Study of the effect of ionizing radiation on the endocrine system and its part in radiation syndrome on the basis of investigations regarding the functional disturbance of the system of the pituitary gland and adrenal cortex after irradiation. The investigations were conducted with rats which had been subjected to minimum absolutely lethal doses of X-rays. It is shown that the biosynthesis of the adrenocorticotrophic hormone (ACTH) in the pituitary gland does not change either in experiments in vivo or in vitro after irradiation. The content of ACTH does not increase in the peripheral blood and the biological half-life of ACTH does not change. G.R.

**A70-38724 # The determination of the haemodynamic characteristics of the heart and of the circulating blood volume in the experiment (Die Bestimmung der hämodynamischen Herzkennziffern und des zirkulierenden Blutvolumens im Experiment).** I. S. Osipov and L. A. Iakovleva (Zentrales Radiologisches Forschungsinstitut, Leningrad, USSR). *Radiobiologia - Radiotherapia*, vol. 11, no. 2, 1970, p. 221-223. In German. (Translation).

Discussion of experiments in which I131-labelled human albumin was used for determining the circulating blood volume, the minute and the stroke-volume of the heart in rabbits. The radioactive substance was injected with an activity of 4-6 microCi into the vein of the ear. The changes of activity in the blood stream were measured by a collimator scintillation counter which was placed over the region of the heart, and recorded as a curve on the tape of a radiocirculograph. The results obtained agree with those given in literature. G.R.

**A70-38797 # Physiological measurements in outer space and their automation problems (Fiziologicheskie izmereniia v kosmose i problema ikh avtomatizatsii).** R. M. Baevskii. Moscow, Izdatel'stvo Nauka, 1970. 255 p. 364 refs. In Russian.

This monograph - a revised and extended version of the author's book 'Physiological methods in astronautics' published in 1965 - discusses techniques of physiological studies during space flights and automatic medical tests with the aid of onboard computers. The topics covered include EKG, EEG, electromyogram, pneumogram, thermogram, seismocardiography, arterial oscillography, sphygmography, heart beat measurements, respiration, muscular activity tests, dynamographic tests, and cutaneous reflexes. Also considered are crew performance evaluation procedures, vestibular apparatus studies, and various calculating algorithms. Medical equipment carried by Soviet and American spacecraft is reviewed. The monograph is addressed to biologists, physicians, mathematicians and engineers active in the field. V.Z.

**A70-38921 A hierarchical model of a helicopter pilot.** Peter Benjamin (Bellcomm, Inc., Washington, D.C.). *Human Factors*, vol. 12, Aug. 1970, p. 361-374. 28 refs.

A hierarchical model of a helicopter pilot is developed and mechanized by means of computer simulation. The basic element of the pilot model is a decision hierarchy which determines the multiloop closure and tracking characteristics of the man-vehicle system. Pilot model input is quantized and used by the hierarchy to determine the specific loop to be closed and the particular transfer function to apply to that loop. The pilot model and vehicle dynamics are implemented on a digital computer. Model validation is provided by comparison of tracking records obtained from this simulation of the vehicle with a human operator. Although developed for a vehicle with only the two lateral degrees of freedom, the pilot model is sufficiently general in form to allow its extension to six degrees of freedom. As a fourth-order system, it is applicable to the control of not only the helicopter, but all VTOL vehicles. The reduction of higher-order inputs to zero permits applicability to vehicles with lower-order dynamics. Its form is independent of the input function. (Author)

**A70-38922 Criteria for the design of helicopter collective controls.** A. M. Stave (United Aircraft Corp., Sikorsky Aircraft Div., Stratford, Conn.). *Human Factors*, vol. 12, Aug. 1970, p. 387-390.

The study described in this report shows that the angle at which a man's thumb rests most comfortably when operating a helicopter collective control is represented by a plane extending from the end of the collective. This comfort plane is tilted downward at an angle of 28 deg and rotated toward the pilot at an angle of 21 deg. For convenient operation all switches should be placed so that their upper surface lies on or near the surface of the Comfort Plane. A mock-up was built using the criteria from the study and received a positive evaluation by test pilots. (Author)

**A70-38923 \*** Effects of lighting and background with common signal lights on human peripheral color vision. Richard A. Dudek (Texas Technological College, Lubbock, Tex.) and George M. Colton (Texas Technological College, Lubbock; NASA, Manned Spacecraft Center, Houston, Tex.). *Human Factors*, vol. 12, Aug. 1970, p. 401-407. Grant No. DA-AD-05-69-C-0102.

The research reported investigated two aspects of binocular peripheral color vision important to an industrial situation, viz., relative color fields of red, yellow, green, and blue test lights; and false color identification under independent variables of color of background, environmental light, and test position. Four male subjects with a similar peripheral vision field (within plus or minus 2 deg of one another) were selected for the study. In general, blue and yellow lights used on a gray background with a low level of environmental light gives the best results for the greatest recognition distance of color and the least number of errors made. Subjects displayed large variation, indicating justification for an industrial firm to institute design procedures to obtain workers that meet specific peripheral color vision requirements. (Author)

**A70-38924** Investigations regarding brightness contrast (Untersuchungen zum Helligkeitskontrast). H. Wässle and F. Heinrich (München, Universität, Munich, West Germany). *Vision Research*, vol. 10, May 1970, p. 361-373. 18 refs. In German.

Brightness contrast was investigated by means of binocular matching made by human observers. The results reveal brightness interactions over surprisingly large visual-angle separations of inducing and test fields. The theoretical part of the investigation includes an attempt to account for contrast phenomena in terms of models of neural networks. Weighting functions were obtained empirically, which describe the strength of neural interactions as a function of the distance between neurons. (Author)

**A70-38925** A nonlinear analysis of the mechanics of accommodation. William D. O'Neill and Jerald S. Brodkey (Illinois, University, Chicago; Presbyterian-St. Luke's Hospital, Ill.). *Vision Research*, vol. 10, May 1970, p. 375-391. 22 refs. Research supported by the University of Illinois and the U.S. Army.

Continuous measurements of the motion of the cat lens in response to ciliary ganglion stimulation have been made for step and sinusoidal changes in stimulation rate. The lens responses of five cats are averaged to arrive at representative, continuous recordings relating lens motion and stimulation rate. A mathematical model is constructed using the step response data as a basis and various dynamic and static system nonlinearities are thereby identified. The sinusoidal data is used as a further check on the general validity of the model. Comparison of the model with experimental results reported by others would indicate the accommodative system in cats is highly damped; exhibits both ciliary muscle and lens dynamics and uses both lens deformation and rigid body translation to change the refractive state of the eye. (Author)

**A70-38926** Geometrical illusions and figural after-effects - The distorting and distorted components of illusions. Gerald H. Fisher and Ann Lucas (Newcastle-upon-Tyne, University, Newcastle-upon-Tyne, England). *Vision Research*, vol. 10, May 1970, p. 393-404. 34 refs. Medical Research Council Grant No. G/968/419 B.

Qualitative observations indicate that illusions remain when their distorting and distorted components are brought into stereoscopic registration. The distortions evident in Poggendorff and Müller-Lyer figures are measured and compared with a registration reference. No differences are evident between stereoscopic and binocular conditions. The convention of distinguishing between 'distorting' and 'distorted' parts of illusions is queried. It is shown that both components of Ebbinghaus and Delboeuf illusions exert

significant mutual influences. Previous research in this field is discussed. It is suggested that the question of what is being measured with respect to what when illusions are presented stereoscopically has not yet been determined satisfactorily. Until this problem is solved arguments favoring one or other locus of the mechanisms responsible for illusory distortions remain questionable. (Author)

**A70-38927** Smearing of the retinal image during voluntary saccadic eye movements. L. Mitrani, St. Mateev, and N. Iakimov (B'lgarska Akademiia na Naukite, Institut po Fiziologija, Sofia, Bulgaria). *Vision Research*, vol. 10, May 1970, p. 405-409. 7 refs.

Voluntary saccades of 13 deg arc are made and temporal thresholds for two kinds of stimuli - horizontal and vertical bands - are obtained. A quantitative estimation of 'smearing' contribution in the process of decrease in vision during voluntary saccade is made. Data, that 'smearing' of the retinal image plays a definite role are given. (Author)

**A70-38928** Dependence of visual suppression on the angular size of voluntary saccadic eye movements. L. Mitrani, N. Iakimov, and St. Mateev (B'lgarska Akademiia na Naukite, Institut po Fiziologija, Sofia, Bulgaria). *Vision Research*, vol. 10, May 1970, p. 411-415. 9 refs.

Voluntary saccades of 17, 15, 13, 11 deg, and 8.30 min arc were made and a 20 msec stimulus presented as the saccade began. The percentage of trials in which the subject reported that he had seen the stimulus was taken as a measure for the vision suppression. A linear dependence between the size of the saccade and the percentage has been observed. The larger the saccade the smaller the percentage of stimuli perceived. This linear dependence gives clear evidence that the simple 'smearing' of the retinal image can not be the only cause for the decrease in vision during a voluntary saccade. (Author)

**A70-38929** Temporal and spatial characteristics of visual suppression during voluntary saccadic eye movement. L. Mitrani, St. Mateev, and N. Iakimov (B'lgarska Akademiia na Naukite, Institut po Fiziologija, Sofia, Bulgaria). *Vision Research*, vol. 10, May 1970, p. 417-422.

An experimental arrangement enables the presentation of stimuli on different places of the retina with variable delays during voluntary saccades. The percentage of stimuli seen in a trial under definite conditions is taken as a measure of vision. Distribution of the visual suppression during voluntary saccade on different places of the retina was obtained. The fovea centralis is not always the most sensitive part of the retina. Data, that both the degree and the time-course of the suppression of different parts of the retina vary during the saccade are given. (Author)

**A70-38958 #** Perfusion peristaltic pump for studying the reaction of the smooth muscle in the vascular bed. S. Gagov, L. Petrov, and S. Tsankov (B'lgarska Akademiia na Naukite, Institut po Fiziologija, Sofia, Bulgaria). *Bolgarska Akademiia Nauk, Doklady*, vol. 23, no. 6, 1970, p. 739-741.

Description of a new perfusion pump for determining the response of the smooth vascular muscle to a certain vascular bed or organ by quantitatively measuring changes in the perfusion pressure produced by the pump. Based on a graphical arrangement, the pump and its operation is explained, and its principal features distinguishing it from other existing models are outlined. It is shown to be very suitable and convenient means for physiological and pharmacological investigations. O.H.

**A70-38963 #** Procedures and certain results of an autocorrelation and spectral analysis of the cardiac contraction rhythm (Metodika i nekotorye rezul'taty avtokorrelatsionnogo i spektral'nogo analiza ritma serdechnykh sokrashchenii). R. M. Baevskii and I. G. Nidekker. In: Computational techniques in physiology and medicine (Vychislitel'naia tekhnika v fiziologii i meditsine). Edited by E. B. Babskii and V. V. Parin. Moscow, Izdatel'stvo Nauka, 1968, p. 151-162. 5 refs. In Russian.

Results of autocorrelation and spectral analyses of the cardiac automation function in healthy subjects and in patients with disturbed functional states of the sinus node (myocardial infarction, hypertension, and acute and chronic cardiac insufficiency). Emphasis is placed on elucidating the role of extracardial regulators in the formation of interrelationships within the dynamic series of values for the cardiac cycle duration. The sinus node together with the sympathetic and vagus nerves and their corresponding nerve centers is examined as a single functional system containing internally circulating control commands with additional control inputs from higher control levels. The state of this system affects its functional characteristics such as the mean pulse rate, its variability, and the distribution of grouped values (histogram). Graphical data are given for the autocorrelation and spectral characteristics of the cardiac rhythm in the subjects. T.M.

**A70-38964 #** Use of multidimensional regression analysis for predicting flight training quality (Ispol'zovanie mnogomernogo regressionnogo analiza dlia prognozirovaniia kachestva letnogo obucheniia). E. I. Garber and V. S. Krasnitskii. In: Computational techniques in physiology and medicine (Vychislitel'naia tekhnika v fiziologii i meditsine). Edited by E. B. Babskii and V. V. Parin. Moscow, Izdatel'stvo Nauka, 1968, p. 172-177. In Russian.

Application of the method of regression analysis to establish a relation between the results of psychophysiological examinations of candidates and estimates of their progress in initial flight training. Comparison of examinations and subsequent evaluations yielded a correlation ratio, a correlation coefficient, and a regression coefficient which served as criteria for the predictive value of these procedures and as initial data for constructing an algorithm to evaluate the purposefulness of further training. The results of calculations are used to compile simple tables which can be employed for integral evaluation of the different procedures in pilot candidate selection. The approach applied to determine the weighting factors assumes a linear relationship between the results of laboratory examinations and the actual flight capabilities of the student. The satisfactory predictive results testify to the validity of this assumption under the conditions of the study but its universal applicability requires further study. T.M.

**A70-38976 \*** Daily rhythms in content and utilization of tyrosine in the whole mouse. C. M. Rose and R. J. Wurtman (MIT, Cambridge, Mass.). *Nature*, vol. 226, May 2, 1970, p. 454, 455. 9 refs. PHS-supported research; Grant No. NGR-22-009-272.

Investigation of the possibility that the rate of transformation of injected tyrosine in the whole mouse varies with time of day. A tabulation shows that the activity of tyrosine transaminase in mouse liver varies diurnally as a function of time of day. It also shows that the daily rhythm in the composite metabolism rate for tyrosine is in phase with the rhythm in total body tyrosine, but is out of phase with the rhythm in hepatic tyrosine transaminase. M.M.

**A70-39981 \*** Hemolysis near an ultrasonically pulsating gas bubble. James A. Rooney (Vermont, University, Burlington, Vt.). *Science*, vol. 169, Aug. 28, 1970, p. 869-871. 12 refs. NIH Grant No. GM-08209; Grant No. NSG(T)-28-S3.

A small volume of an erythrocyte suspension was subjected to

the action of a manipulated gas bubble set into stable oscillation at 20 kilohertz. Release of hemoglobin occurred when the oscillation amplitude exceeded a critical threshold. Hydrodynamic stresses resulting from acoustically induced small-scale eddying motion near the bubble may be the mechanism of hemolysis. (Author)

**A70-38982 \*** Effects of lighting on epinephrine synthesis in the rat. Larissa A. Pohorecky, Walter E. Stamm, and Richard J. Wurtman (MIT, Cambridge, Mass.). *Journal of Neuro-Visceral Relations*, vol. 31, 1969, p. 275-279. 17 refs. NIH Grants No. AM-11237; No. AM-11709; Grant No. NGR-22-009-272.

Description of experiments demonstrating that exposure of rats to continuous light or darkness can modify phenylethanolamine-N-methyl-transferase (PNMT) activity and adrenal epinephrine content. Female rats were maintained in continuous light or darkness or in cyclic illumination for four weeks. It was found that continuous exposure to either light or darkness was associated with decreases in the epinephrine content and PNMT activity of the adrenals. Both treatments abolished the afternoon rise in adrenal corticosterone concentration. M.V.E.

**A70-38983 #** Bone loss as a result of immobilization and chelation - Preliminary results in Macaca mulatta. Leon E. Kazarian and Henning E. Von Gierke (USAF, Aerospace Medical Research Laboratory, Wright-Patterson AFB, Ohio). *Clinical Orthopaedics*, July-Aug. 1969, p. 67-75. 10 refs.

Study of the macroscopic architectural changes of cancellous and cortical bone in the Rhesus monkey as a result of (1) 60 days' immobilization in full-body plaster of Paris and (2) the chemical removal of calcium from the body by slow intravenous infusion of Na<sub>2</sub>EDTA. Compression testing of fresh vertebral segments removed from the primates after immobilization revealed considerable loss of bone strength with respect to axial compressive loading of individual vertebral bodies. There was an overall diffuse increase in radiographic translucency which could not yet be reliably quantitated in the vertebral column with the bone densitometric technic used. Qualitative radiographic technics demonstrated increased bone resorption in the metaphysis of the axially loaded long bones, and loss of cortical bone. G.R.

**A70-38985 \*** An event-coder for evoked potential studies. E. Donchin (NASA, Ames Research Center, Environmental Biology Div., Moffett Field, Calif.) and N. Pappas (Iconix, Inc., Menlo Park, Calif.). *Behavior Research Methods and Instrumentation*, vol. 2, no. 3, 1970, p. 142-144.

A device is described which has 10 input and 2 output lines. Grounding an input causes a pulse with a specific amplitude, polarity, and duration to appear on one of the output lines. Pulse parameters can be set by front-panel controls. Thus, 10 distinct events can be coded by associating a unique pulse with each event. These pulses can be recorded on one (or two) channels of a magnetic tape recorder for subsequent processing. The use of this coder in the study of event-related potentials is described. (Author)

**A70-38986 \*** The pulmonary and systemic circulatory response to dopamine infusion. D. C. Harrison, Suellen Pirages, Sherilyn C. Robison, and B. U. Wintroub (Stanford University, Palo Alto, Calif.). *British Journal of Pharmacology*, vol. 37, Nov. 1969, p. 618-626. 8 refs. Research supported by the American Heart Association; NIH Grants No. HE-09058; No. HE-5709; No. HE-05866; Grant No. NGL-05-020-305.



Study of pulmonary and systemic circulatory responses to dopamine infused in eight mongrel dogs. It was found that the systemic circulatory response to dopamine is similar to that described by previous investigators. The increased pulmonary pressures without change in resistance suggest a dopamine-induced increase in smooth muscle tension in the pulmonary vasculature.

M.M.

**A70-38990 \*** Acute reversal of the sleep-waking cycle in man - Effect on sleep stage patterns. Elliot D. Weitzman (Montefiore Hospital; Yeshiva University, Bronx, N.Y.), Daniel F. Kripke, Donald Goldmacher, Peter McGregor, and Chris Nogueira (Yeshiva University, Bronx, N.Y.). *Archives of Neurology*, vol. 22, June 1970, p. 483-489. 29 refs. PHS Grant No. EC-00341-01; Grant No. NGR-33-023-032.

Description of changes in sleep pattern when normal young adults were subjected to an acute inversion of sleep-waking cycles in a laboratory environment. A significant increase in waking and a decrease in REM sleep time occurred during the inverted sleep period. After reversal there was a shift of REM and stage 2 sleep toward the early part of the sleep period, and waking shifted toward the latter part. In addition, the duration of episodes of all stages of sleep decreased, and the number of changes of sleep stage increased after reversal. Despite these changes in duration, amount, stability, and timing of sleep stages, the basic 90 to 100 minute cycling was preserved following acute inversion to day sleep.

M.M.

**A70-38991 \*** Plasma tocopherol concentrations and vitamin E deficiency in dogs. K. C. Hayes, D. M. Hegsted (Harvard University, Boston, Mass.), and J. E. Rousseau, Jr. (Connecticut, University, Storrs, Conn.). *American Veterinary Medical Association, Journal*, vol. 157, July 1, 1970, p. 64-71. 25 refs. Research supported by Harvard University; Grant No. NGR-22-007-001.

The plasma tocopherol concentrations of 71 dogs were measured in 3 groups of animals. In the 1st group of 43 pups, low plasma tocopherol values were associated with the rigors of a commercial breeding farm. The concentrations of 21 animals from the dog population at large indicated that most healthy dogs have adequate plasma concentrations, whereas those of debilitated dogs vary widely. A 3rd group of dogs fed an experimental ration, which apparently had deteriorated in tocopherol activity during storage, provided evidence of pathologic changes in smooth muscle, the central nervous system, skeletal muscle, and the retina. (Author)

**A70-38992 \*** Chemical origins of cells. Sidney W. Fox, Kaoru Harada, George Mueller (Miami, University, Coral Gables, Fla.), and Gottfried Krampitz (Bonn, Universität, Bonn, West Germany). *Chemical and Engineering News*, vol. 48, June 22, 1970, p. 80-94. 10 refs. Grant No. NGR-10-007-052.

Discussion of the chemistry of transition between inanimate and animate models, and of the related topics of primitive nucleic acids, contemporary nucleic acids, lipids, and other subjects for which partial models are available. Syntheses of many small bioorganic molecules, of many macromolecules resembling biopolymers, and the self-assembly of cell-like microsystems are demonstrated. These last two demonstrations have been performed in experiments under conditions that are found in abundance on the contemporary earth, and that are also inferable for the primitive earth. At the level of macromolecule and protocell, the research conducted has provided, in experimentally repeatable detail, answers, in principle, to the questions of how enzymes came into existence without enzymes to make them, how cells came into existence without cells to make them, how membranes arose, how replication began and how 'information' arose in macromolecules without the complex contemporary code.

O.H.

**A70-38993 \*** Histochemical distribution of acetylcholinesterase and simple esterases in the brain of squirrel monkey (*Saimiri sciureus*). Sohan L. Manocha (Emory University, Atlanta, Ga.). *Histochemie*, vol. 21, 1970, p. 236-248. 35 refs. NIH-supported research; Grant No. NGR-11-001-016.

Investigation of the distribution of acetylcholinesterase (AChE) and simple esterases (SE) in 15 micron thick fresh frozen sections of the squirrel monkey brain. The neuropil in most of the nuclei of the brain shows stronger SE activity compared to the AChE reaction. In the area postrema, the neurons give stronger SE activity than the parenchymal cells, while the AChE activity in both types of cells is similar. The significance of these and other observations is discussed.

M.V.E.

**A70-38994 \*** The relationship of nocturnal headaches to sleep stage patterns. James D. Dexter (Montefiore Hospital; Yeshiva University, Bronx, N.Y.; Missouri University, Columbia, Mo.) and Elliot D. Weitzman (Yeshiva University, Bronx, N.Y.). (*American Academy of Neurology, Annual Meeting, 21st, Washington, D.C., Apr. 1969*.) *Neurology*, vol. 20, May 1970, p. 513-518. 22 refs. Research supported by the Irwin Strasburger Memorial Medical Foundation; PHS Grants No. NB-03356; No. 2-T1-MH-6418; No. 5-RO1-UI-00506; NIH Grant No. FR-50; Grant No. NGR-33-023-032.

Investigation of the nocturnal sleep patterns of patients who had the onset of migraine during nocturnal sleep, in order to determine if a relationship exists between the headache attack and a stage of sleep. Seven patients were observed for seven consecutive nights using EEG, EOG, and chin EMG recording. The nocturnal sleep patterns obtained are shown graphically and discussed. The data strongly suggest that the occurrence of nocturnal migraine and cluster headache attacks is temporarily related to the rapid eye movement sleep stage.

O.H.

**A70-38995 \*** A simplified model of serum growth hormone regulation in man. James C. Howard and Donald R. Young (NASA, Ames Research Center, Biotechnology Div., Moffett Field, Calif.). *Computers and Biomedical Research*, vol. 3, Apr. 1970, p. 101-107. 8 refs.

A mathematical model of the glandular mechanism that controls the secretions of serum growth hormone in response to a glucose deficiency has been formulated. It was found that the concentration levels predicted by a linear model were in good agreement with experimental observations. Time domain analysis led to a number of interesting conclusions. By relating the mathematical parameters to physiological sensitivities, results were obtained that hopefully will be of value in diagnosis. Likewise, frequency domain analysis revealed a number of possible control mechanisms by which the pituitary gland controls the secretions of serum growth hormone. It is shown that defects in physiological control elements can deplete the available supply of growth hormone by permitting hormonal oscillations. A summary of the literature, which includes references to relevant publications on this subject, was presented previously.

(Author)

**A70-38996** The effects of hypoxia on certain aspects of visual performance. Morton K. Ohlbaum (USAF, Aerospace Medical Research Laboratories, Wright-Patterson AFB, Ohio). *American Journal of Optometry and Archives of American Academy of Optometry*, vol. 46, Apr. 1969, p. 235-249. 26 refs.

Accommodation, convergence, and stereoacuity were measured in 19 aviators at sea level and at altitudes to 18,000 ft. Most subjects showed a decrement of all three skills, while none improved. Hypoxia has a detrimental effect on these functions, but there is considerable variation in tolerance to oxygen deprivation. No change was observed in phorias or in plus acceptance at near. A small but steady shift toward myopia was observed with increased altitude.

(Author)

**A70-38997 \*** Influence factors for the temperature control during exercise (Einflussfaktoren für die Temperaturregulation bei Anstrengungen). J. E. Greenleaf and B. L. Castle (NASA, Ames Research Center, Laboratory of Human Environmental Physiology, Moffett Field, Calif.). *Arbeitsmedizin, Sozialmedizin, Arbeitshygiene*, vol. 5, Apr. 1970, p. 82-84. 15 refs. In German.

Discussion of the various factors other than work, ambient temperature, and air humidity, which produce changes of the core temperature of the human body measured during exercise. The mechanisms controlling the increase in core temperature are examined and it is shown that the major control is effected through heat dissipation. In contrast to the current theory, however, it is suggested that during exercise the control of sweating is much more complicated than a simple rectal and skin temperature relationship.

O.H.

**A70-39125 #** Sound level versus time for noise exposure. Robert W. Young (U.S. Naval Undersea Research and Development Center, San Diego, Calif.). *Acoustical Society of America, Spring Meeting, 79th, Atlantic City, N.J., Apr. 21-24, 1970, Paper FF2*. 6 p. 5 refs.

Analysis of the noisiness of a succession of varying sounds, stating the equivalence to the varying sound by the maximum level and effective duration of a constant sound at that level, yet with different exchange rates. For comparison of all the data on the same basis, exchange rates have been found by least-squares fits, however, in a way that one can see how well different exchange rates fit the data. For mathematical convenience, a reference duration of 1 sec has been chosen; the exchange rates would be the same if 4 sec or any other single time were chosen as the reference duration. M.M.

**A70-39151 #** Immunopathology of myocardial infarct. J. Domaniewski (Szpital Ogólny Nr. 1, Bydgoszcz, Poland). (*Bydgoskie Towarzystwo Naukowe, Wydział Nauk Przyrodniczych, Prace, Seria A*, no. 12, 1969.) *Polish Medical Journal*, vol. 9, no. 2, 1970, p. 267-303. 73 refs. Translation.

Investigation of the primary and secondary immunological response of myocardial antigens in the course of first and successive myocardial infarcts. It has been found that the myocardium comprised in the focus of infarction loses its normal antigenic properties within the first 24 hrs of the disease. These components of the cytoplasm of myocardial fiber which are potential autoantigens penetrate from the necrotic focus into the lymphatic system. The phagocytosis of these antigens by the macrophages of the lymph nodes initiates the production of autoantibodies by the plasma cells. Necrotizing myocardial fibers become imbued with plasma fibrinogen which determines the coagulating character of the necrosis. The absence of immunoglobulins and complement from the myocardial necrotic focus contradicts, however, the share of autoimmunization in the development and outcome of myocardial infarct. On the basis of the sequence of the production of heart autoantibodies of the class IgM and IgG, the first immunological response has been distinguished following a first myocardial infarct, while the second one has been singled out as a consequence of a second and successive infarcts. M.M.

**A70-39166 \*** Circadian rhythms in human heart homograft. Irvin A. Kraft, Steven Alexander, Delbert Foster, Robert D. Leachman, and Harry S. Lipscomb (Baylor University, Houston, Tex.). *Science*, vol. 169, Aug. 14, 1970, p. 694-696. 11 refs. Research supported by the Texas Heart Association; NIH Grant No. TT-00259; Contract No. NAS 9-2323.

The electrocardiogram and cardiograph of a patient with a human heart transplant has been recorded for 72 hours. Within the donor P-QRS-T complex, one can identify the P waves emanating from residual sinoatrial heart tissue of the recipient. The recipient P

waves are independent of the donor complexes. A clear circadian rhythm (23.4 hours) in heart rate is maintained for both donor and recipient tissue, the donor complexes preceding by a phase shift of 135 minutes the complexes of the recipient heart tissue. Both tissues display clear morning and evening minimum and maximum rates paralleling activity and lighting cycles. (Author)

**A70-39172 \*** Evaluation of several TV display system configurations for visual simulation of the landing approach. Wendell D. Chase (NASA, Ames Research Center, Moffett Field, Calif.). *IEEE Transactions on Man-Machine Systems*, vol. MMS-11, Sept. 1970, p. 140-149. 8 refs.

Results of a study to determine the effects of several variations of two types of visual display systems on subjective pilot evaluations, and objective measures of performance in the landing approach. Two types of flight approaches were made with either a projector or a collimated monitor visual display: the instrument approach, and the visual approach without the normal cockpit instrumentation assistance. The variables examined were color, differences between displays due to collimation, and reduced resolution. The pilots tested were more critical of the black and white variation for either display, and favored more use of a color system. F.R.L.

**A70-39199** The use of posterior lead in cardiovascular stress testing. Richard W. Call, John W. Copeman, Don R. Kaserman (Union Oil Company of California, Los Angeles, Calif.), and Basil Clyman. (*Industrial Medical Association, Annual Meeting, 55th, Chicago, Ill., Apr. 16, 1970*.) *Journal of Occupational Medicine*, vol. 12, July 1970, p. 241-245. 10 refs.

Description of a technique for cardiovascular stress testing using a bipolar lead with the anterior positive electrode situated at or near the fifth interspace in the left midclavicular line. In a study of 561 men, 7.3% were found to have positive electrocardiographic changes in the V4 position. Some of these same patients also showed ischemic abnormalities from the inferior leads. More importantly 4.5% were found to have only inferior wall ischemic changes and no similar left ventricular wall ischemic pattern. M.M.

**A70-39234 \*** Ethylene inhibition of auxin transport by gravity in leaves. Charles J. Lyon (Dartmouth College, Hanover, N.H.). *Plant Physiology*, vol. 45, 1970, p. 644-646. 11 refs. Grant No. NGR-30-001-001.

Critical testing of the hypothesis of ethylene inhibition of the unknown mechanism for downward transport of auxin in leaves. Methods developed for studies in which gravity was not transplanting auxin in rotated leaves were applied. The experimental results show that the evidence for interference of ethylene with lateral transport of auxin under the influence of gravity supports an understanding of the unknown mechanism as controlled by a system of biochemical processes. The similar inhibitory effect of ethylene on petioles and on seedling stems (Burg and Burg, 1966), in contrast with the absence of an effect on coleoptiles, suggests a need for a direct, downward, anatomical pathway for the steps in the transport which are open to inhibition by ethylene. M.M.

**A70-39361** Pathophysiology of congenital heart disease; Proceedings of a Conference, University of California, Los Angeles, Calif., July 1967. Conference sponsored by the University of California and the American College of Cardiology. Edited by F. H. Adams, V. E. Hall (California, University, Los Angeles, Calif.), and H. J. C. Swan (Cedars-Sinai Medical Center, Los Angeles, Calif.). Berkeley, Calif., University of California Press (UCLA Forum in Medical Sciences, No. 10), 1970. 442 p. \$26.50.

## Contents:

Foreword. F. H. Adams (California, University, Los Angeles, Calif.), 1 p.

Mechanical analysis of cardiac contractility. A. J. Brady, p. 139-147. (See A70-39362 20-04)

The mechanics of contraction of the intact heart. J. Ross, Jr. (National Heart Institute, Bethesda, Md.) and E. H. Sonnenblick (National Heart Institute, Bethesda, Md.; Peter Bent Brigham Hospital, Boston, Mass.), p. 149-161. 25 refs. (See A70-39363 20-04)

Determinants of ventricular function. J. H. Mitchell and C. B. Mullins (Texas, University, Dallas, Tex.), p. 163-180. 47 refs. (See A70-39364 20-04)

An analysis of the determinants of ventricular dimensions and force-velocity relations in man. E. Braunwald (National Heart Institute, Bethesda, Md.), p. 231-245. 36 refs. (See A70-39365 20-04)

Telemetry study of regional blood flow in exercising sled dogs. R. L. Van Citters (Washington, University, Seattle, Wash.) and D. L. Franklin (California, University, La Jolla, Calif.), p. 273-288. 14 refs. (See A70-39366 20-04)

Regulation of the pulmonary circulation. L. M. Lind and D. H. Simmons (California, University, Los Angeles, Calif.), p. 321-329. 21 refs. (See A70-39367 20-04)

Exploratory electrocardiography - Use of isopotential surface maps. S. D. Blumenschein, M. S. Spach, J. T. Flaherty, J. P. Boineau, R. C. Barr, and T. M. Gallie (Duke University, Durham, N.C.), p. 347-368. 9 refs. (See A70-39368 20-04)

Digital computer model of a total body ECG surface map - Adult male torso simulation with lungs. R. H. Selvester (Rancho Los Amigos Hospital, Downey; Southern California, University, Los Angeles, Calif.), J. C. Solomon, and T. L. Gillespie (Medical Information Systems Corp., Downey, Calif.), p. 369-376. 8 refs. (See A70-39369 20-05)

Radio telemetry techniques for measurement of blood pressure and flow in unrestrained animals. D. L. Franklin, W. S. Kemper (California, University, La Jolla, Calif.), R. L. Van Citters, and N. W. Watson (Washington, University, Seattle, Wash.), p. 377-382. 9 refs. (See A70-39370 20-05)

Evolution of electromagnetic blood flowmeters. A. Kolin (California, University, Los Angeles, Calif.), p. 383-405. 33 refs. (See A70-39371 20-05)

Author index, p. 435-437.

Subject index, p. 439-446.

**A70-39362** Mechanical analysis of cardiac contractility. Allan J. Brady. In: Pathophysiology of congenital heart disease; Proceedings of a Conference, University of California, Los Angeles, Calif., July 1967. (A70-39361 20-04) Conference sponsored by the University of California and the American College of Cardiology. Edited by F. H. Adams, V. E. Hall, and H. J. C. Swan. Berkeley, Calif., University of California Press (UCLA Forum in Medical Sciences, No. 10), 1970, p. 139-147.

Review of some of the many ways in which cardiac muscle contractile responses can be characterized. It is pointed out that a somewhat more specific definition of contractility can be proposed which describes changes in muscle function specifically in terms of chemical coupling events. When the contractile element is, in effect, clamped at constant length, inotropic changes can be compared on an instantaneous time basis uncomplicated by indeterminable internal length changes and other physical parameters. As an index of contractility, the rate of change of isometric force development seems to be the closest approximation to the offered definition of contractility, and should reflect more of the kinetics of coupling with minimal physical complications than other methods discussed. It is noted that it will be necessary to implement accurate methods of determining the compliance of whole-heart preparations and clamping apparatus with which to measure contractility in the intact heart in order to make this concept of contractility a clinically useful tool.

M.M.

**A70-39363** The mechanics of contraction of the intact heart. John Ross, Jr. (National Heart Institute, Bethesda, Md.) and Edmund H. Sonnenblick (National Heart Institute, Bethesda, Md.; Peter Bent Brigham Hospital, Boston, Mass.). In: Pathophysiology of congenital heart disease; Proceedings of a Conference, University of California, Los Angeles, Calif., July 1967. (A70-39361 20-04) Conference sponsored by the University of California and the American College of Cardiology. Edited by F. H. Adams, V. E. Hall, and H. J. C. Swan. Berkeley, Calif., University of California Press (UCLA Forum in Medical Sciences, No. 10), 1970, p. 149-161. 25 refs.

Discussion of recent studies concerned with the mechanics of contraction of the intact heart. It is pointed out that the application of the principles of muscle mechanics to the analysis of ejecting beats has provided considerable insight into the manner in which changes in inotropic state and in mechanical loading conditions alter cardiac function. It is useful to place the analysis of isovolumic and ejecting beats into a three-dimensional structure. This format allows the integration of the isovolumic force-velocity relation, the isovolumic length-tension relation, and the characteristics of fiber shortening during ejection. Within this framework of force, velocity and fiber length it is then possible to predict the effects on the intact left ventricle of altered fiber length, altered afterload, and changes in the inotropic state.

M.M.

**A70-39364** Determinants of ventricular function. Jere H. Mitchell and Charles B. Mullins (Texas, University, Dallas, Tex.). In: Pathophysiology of congenital heart disease; Proceedings of a Conference, University of California, Los Angeles, Calif., July 1967. (A70-39361 20-04) Conference sponsored by the University of California and the American College of Cardiology. Edited by F. H. Adams, V. E. Hall, and H. J. C. Swan. Berkeley, Calif., University of California Press (UCLA Forum in Medical Sciences, No. 10), 1970, p. 163-180. 47 refs. Research supported by the Dallas Heart Association; PHS Grants No. HE-06296; No. HE-07717.

Review of the principles involved in evaluating ventricular performance in terms of a compression pump, and discussion of some of the major determinants of ventricular function when it is examined by this approach. The Frank-Starling principle, which states that the mechanical activity of the left ventricle is related to the end-diastolic fiber length, forms the basis for the evaluation of ventricular function in terms of a compression pump. Although probably the most logical estimate of the end-diastolic fiber length would be either the volume or the area of a shell of cardiac muscle adjacent to the cavity of the left ventricle, the great majority of physiological and clinical investigations have used ventricular function curves relating stroke work or stroke power to the end-diastolic pressure of the ventricle. This is a less desirable approach, since the end-diastolic pressure is not as sensitive or as reliable an index of fiber length. It is also important that heart rate and aortic resistance be controlled when the effect of other interventions is being examined.

M.M.

**A70-39365** An analysis of the determinants of ventricular dimensions and force-velocity relations in man. Eugene Braunwald (National Heart Institute, Bethesda, Md.). In: Pathophysiology of congenital heart disease; Proceedings of a Conference, University of California, Los Angeles, Calif., July 1967. (A70-39361 20-04) Conference sponsored by the University of California and the American College of Cardiology. Edited by F. H. Adams, V. E. Hall, and H. J. C. Swan. Berkeley, Calif., University of California Press (UCLA Forum in Medical Sciences, No. 10), 1970, p. 231-245. 36 refs.

Review of investigations of the determinants of ventricular dimensions and myocardial free-velocity relations in man. It is pointed out that the normal cardiac response to exercise involves the integrated effects on the myocardium of simple tachycardia, sympa-



thetic stimulation, and the operation of the Frank-Starling mechanism. During submaximal levels of exertion, cardiac output can rise even when one or two of these influences are blocked. However, during maximal levels of muscular exercise, the ventricular myocardium requires all three influences in order to sustain a level of activity sufficient to satisfy the greatly augmented oxygen requirements of the exercising skeletal muscles. M.M.

**A70-39366 Telemetry study of regional blood flow in exercising sled dogs.** Robert L. Van Citters (Washington, University, Seattle, Wash.) and Dean L. Franklin (California, University, La Jolla, Calif.). In: Pathophysiology of congenital heart disease; Proceedings of a Conference, University of California, Los Angeles, Calif., July 1967. (A70-39361 20-04) Conference sponsored by the University of California and the American College of Cardiology. Edited by F. H. Adams, V. E. Hall, and H. J. C. Swan. Berkeley, Calif., University of California Press (UCLA Forum in Medical Sciences, No. 10), 1970, p. 273-288. 14 refs. Work supported by the American Heart Association and the Washington State Heart Association; Contract No. AF 41(609)-67.

Experimental testing of the hypothesis that a compensatory decrease in visceral flow occurs during severe exercise in sled dogs, the blood thus diverted constituting an important cardiovascular reserve mechanism that augments the cardiac output in supplying the demands of skeletal muscle. Previous observations and the results of the present studies strongly suggest that the blood flow to visceral beds is well maintained during exercise and that shunting of blood away from these areas contributes insignificantly to the exercise response. M.M.

**A70-39367 Regulation of the pulmonary circulation.** Leonard M. Linde and Daniel H. Simmons (California, University, Los Angeles, Calif.). In: Pathophysiology of congenital heart disease; Proceedings of a Conference, University of California, Los Angeles, Calif., July 1967. (A70-39361 20-04) Conference sponsored by the University of California and the American College of Cardiology. Edited by F. H. Adams, V. E. Hall, and H. J. C. Swan. Berkeley, Calif., University of California Press (UCLA Forum in Medical Sciences, No. 10), 1970, p. 321-329. 21 refs.

Discussion of some mechanisms of regulation of pulmonary circulation. On the basis of previous work and of some recent laboratory studies, a hypothesis is put forth regarding the development of pulmonary hypertension in some congenital heart diseases. It is concluded that pulmonary blood flow is certainly the major determinant of pulmonary vascular resistance and of the status of the pulmonary vascular bed. Lung volume, oxygen tension, acid-base variations, and neurologic control all have effects on the pulmonary circulation but they are small in relation to flow itself. Just as flow is the major determinant of the geometry of the pulmonary vessels, it is probably the major determinant of pulmonary hypertension and pulmonary vascular disease secondary to its distension of reserve vessels and the ensuing increased ability of various vasoconstrictive stimuli to elevate pulmonary vascular pressures. M.M.

**A70-39368 Exploratory electrocardiography - Use of isopotential surface maps.** Sarah D. Blumenschein, Madison S. Spach, John T. Flaherty, John P. Boineau, Roger C. Barr, and Thomas M. Gallie (Duke University, Durham, N.C.). In: Pathophysiology of congenital heart disease; Proceedings of a Conference, University of California, Los Angeles, Calif., July 1967. (A70-39361 20-04) Conference sponsored by the University of California and the American College of Cardiology. Edited by F. H. Adams, V. E. Hall, and H. J. C. Swan. Berkeley, Calif., University of California Press (UCLA Forum in Medical Sciences, No. 10), 1970, p. 347-368. 9 refs. PHS Grants No. HE-11307; No. HTS-5372; No. HTS-5716.

Demonstration of the relationship of the body surface potential

distribution (isopotential surface maps) to the conventional ECG and Frank vectorcardiogram (VCG) during several QRS stages. The conditions selected are: (1) the normal child during expiration, (2) the effects of inspiration in the normal child, and (3) a patient with a secundum atrial septal defect (ASD). M.M.

**A70-39369 Digital computer model of a total body ECG surface map - Adult male torso simulation with lungs.** Ronald H. Selvester (Rancho Los Amigos Hospital, Downey; Southern California, University, Los Angeles, Calif.), Joseph C. Solomon, and Thomas L. Gillespie (Medical Information Systems Corp., Downey, Calif.). In: Pathophysiology of congenital heart disease; Proceedings of a Conference, University of California, Los Angeles, Calif., July 1967. (A70-39361 20-04) Conference sponsored by the University of California and the American College of Cardiology. Edited by F. H. Adams, V. E. Hall, and H. J. C. Swan. Berkeley, Calif., University of California Press (UCLA Forum in Medical Sciences, No. 10), 1970, p. 369-376. 8 refs. PHS Grants No. HE-09123; No. HE-10722; No. HE-07888.

Description of a digital computer model which places the physiologically and anatomically based cardiac generator simulation in a realistic male torso simulation with lungs. The total body surface equipotential maps resemble those seen by Taccardi (1963) to within the resolution of these maps through most of the ventricular depolarization. Simulated 13-lead ECGs and VCGs for any desired lead system can be picked up at will from the surface maps and recorded as conventional scalar plots or X-Y vector plots. The fact that such simulated ECGs and VCGs were well within the range of those recorded in normals with each of these surface lead configurations further validates the model. This anatomically and physiologically based model will, when properly validated, provide a rational basis for a methodical exploration of the parameters in the torso, such as variations in torso shape, inhomogeneities, and heart size and location, that might influence surface ECGs. M.M.

**A70-39370 \* Radio telemetry techniques for measurement of blood pressure and flow in unrestrained animals.** Dean L. Franklin, W. Scott Kemper (California, University, La Jolla, Calif.), Robert L. Van Citters, and Nolan W. Watson (Washington, University, Seattle, Wash.). In: Pathophysiology of congenital heart disease; Proceedings of a Conference, University of California, Los Angeles, Calif., July 1967. (A70-39361 20-04) Conference sponsored by the University of California and the American College of Cardiology. Edited by F. H. Adams, V. E. Hall, and H. J. C. Swan. Berkeley, Calif., University of California Press (UCLA Forum in Medical Sciences, No. 10), 1970, p. 377-382. 9 refs. NASA-supported research; NIH Grants No. HE-08337; No. HE-09217; No. HE-08433.

Description of a practical system for the measurement and radio telemetry of blood pressure and flow from unrestrained animals. The technique for pressure and flow telemetry involves the chronic implantation of a miniature pressure sensor within the aorta or ventricle, and chronic implantation of flow sensors around the major blood vessels. The pressure-measuring system is suitable for telemetry from chronic animal preparations because its small size eliminates the necessity of chronic catheter implants and the associated difficulties. The high thermal stability and high voltage output from the pressure gauge relieve the stringent specifications on the stability of the VCO (voltage-controlled oscillator) required for telemetry. M.M.

**A70-39371 Evolution of electromagnetic blood flowmeters.** Alexander Kolin (California, University, Los Angeles, Calif.). In: Pathophysiology of congenital heart disease; Proceedings of a Conference, University of California, Los Angeles, Calif., July 1967.

(A70-39361 20-04) Conference sponsored by the University of California and the American College of Cardiology. Edited by F. H. Adams, V. E. Hall, and H. J. C. Swan. Berkeley, Calif., University of California Press (UCLA Forum in Medical Sciences, No. 10), 1970, p. 383-405. 33 refs. Navy-supported research; PHS Grants No. HE-03092; No. GRSG I-SOL FRO 5334; AEC Contract No. AT (04-1)-GEN-12.

Brief summary of the basic principles involved in an electromagnetic flowmeter method for circulatory research. The variety of quite diverse devices through which the method can be implemented is reviewed. A scheme of the electromagnetic catheter blood flowmeter is shown. It is pointed out that it is reasonable to expect that some of the most fruitful applications of electromagnetic flowmeters to the solution of clinical problems and problems in human physiology will result from further development of electromagnetic catheter flowmeters. M.M.

**A70-39406 Toxicologic aspects of flammability and combustion of polymeric materials.** John Autian (Tennessee, University, Memphis, Tenn.). *Journal of Fire and Flammability*, vol. 1, July 1970, p. 239-268. 32 refs.

Examination of the toxicity problems which may result from the burning or heating of manmade polymeric materials. There are numerous complex situations relating to the effect a chemical agent may have on biological systems. Results of the burning of manmade materials are described, followed by a review of the factors which will be responsible for the death or serious incapacitation of persons in or in the vicinity of a fire. Laboratory experiments on the toxicity of thermal degradation products of polymeric materials are described, and comment is made on the need for development of standardized toxicity testing procedures. F.R.L.

**A70-39419 Changes of protein solutions and cell cultures by radiation from ruby and neodymium lasers (Veränderungen von Proteinlösungen und Zellkulturen durch Rubin- und Neodymiumlaserstrahlung).** N. F. Gamaleia, O. F. Pasechnik, and E. D. Shishko (Forschungsinstitut für experimentelle und klinische Tumorforschung, Kiev, Ukrainian SSR). *Laser*, vol. 2, June 1970, p. 19. 6 refs. In German.

Investigation of changes in protein solutions and cell cultures by laser radiation taking into consideration the causes for the observed effects. It is found that cultures of the type HeLa, Hep-2, and KB of a thickness of one cell layer are adversely affected in two ways by laser radiation if the energy involved exceeds a certain threshold value. The irradiation of thin layers of albumin and blood plasma is also investigated. G.R.

**A70-39425 Injury by ruby laser and pigmentation of the iris (Schädigung durch Rubinlaser und Pigmentation der Iris).** G. K. Watts (Institute of Ophthalmology, London, England). *Laser*, vol. 2, June 1970, p. 49, 50. In German.

Study of the relation between the position and the number of energy absorbing pigment particles in the iris and the extent of injury caused by laser radiation. Rabbits, apes, and guinea pigs were used in the experiments. It was found that the areas of maximum injury coincide approximately with the areas of maximum pigmentation. Specific forms of injury sustained differ for the three species investigated. G.R.

**A70-39427 Hemodynamic changes in the Andean native after two years at sea level.** Natalio Bancho (Colorado, University, Denver, Colo.) and Julio C. Cruz (Universidad Peruana, Lima, Peru). *Aerospace Medicine*, vol. 41, Aug. 1970, p. 849-853. 8 refs.

Eleven healthy high altitude natives were studied by right heart catheterization in Morococha, Peru, at 4,540 m altitude. They were restudied in Lima, at 150 m, after 2 years of continuous residence at this level. Intravascular pressures and cardiac output were measured at rest and during exercise on a bicycle ergometer. A significant decrease in heart rate was observed after two years at sea level. Resting cardiac output increased from 3.83 L/min/sq m at high altitude to 4.45 L/min/sq m at sea level due to a highly significant increase in stroke index. However, no changes in mean systemic arterial pressure were found at sea level due to a fall in systemic vascular resistance. Pulmonary artery pressure and pulmonary vascular resistance decreased significantly after 2 years at sea level. At sea level, changes in mean pulmonary artery pressure during supine exercise were significantly less than those observed at high altitude but larger than those seen in normal sea level residents. This latter finding appears to be related to incomplete regression of the anatomic characteristics of the pulmonary vasculature. (Author)

**A70-39428 Effect of hypobaric hypoxia on MM virus infection.** David J. Giron, Frank F. Pindak, and Jerome P. Schmidt (USAF, School of Aerospace Medicine, Brooks AFB, Tex.). *Aerospace Medicine*, vol. 41, Aug. 1970, p. 854, 855. 6 refs.

The resistance of mice to MM virus infection was lowered by exposure of the animals to hypobaric hypoxia (18,000 ft). The most adverse effects were seen in those animals exposed to the test environment immediately after infection. There was a greater decrease in resistance against infection by the intranasal route than by the intraperitoneal route. Recovery by the animals from the adverse effects of altitude appeared to be rapid. (Author)

**A70-39429 Recent improvements in hypoxia warning systems.** Gerald A. Rost (Beckman Instruments, Inc., Fullerton, Calif.). *Aerospace Medicine*, vol. 41, Aug. 1970, p. 865-869. 7 refs.

Among the many methods considered in recent years for hypoxia warning systems for aircraft and spacecraft, polarographic sensing devices appear extremely suitable. Two types of systems have been tested - one small enough for face-mask installation, and a larger one for cabin mounting, modified for improved sensor life and the ability to withstand vacuum and low temperatures. This paper describes the design and performance of the sensor and the miniaturized electronic system. The testing methods and test results are also discussed. (Author)

**A70-39430 Factors influencing hypertension and pulmonary edema produced by hyperbaric O<sub>2</sub>.** C. D. Wood and G. F. Perkins (Louisiana State University, Shreveport, La.). *Aerospace Medicine*, vol. 41, Aug. 1970, p. 869-872. 20 refs. U.S. Veterans Administration Grant No. RC-515-4.

The pulmonary edema that develops as a result of exposure to hyperbaric oxygen is secondary to an episode of acute hypertension. The high partial pressure of oxygen may block the CO<sub>2</sub> transport mechanism in the blood producing a high tissue CO<sub>2</sub>. A sympathetic activation producing a systemic vasoconstriction resulting in hypertension then occurs. Factors which diminish this response, such as anesthesia, hemorrhage, or sympathetic blocking agents, prevent or prolong the development of pulmonary edema. Survival time is shortened by amphetamine, L-Dopa or breathing higher percentages of CO<sub>2</sub> which are factors that enhance these reactions. (Author)

**A70-39431 # Resistance to bacterial infection in a hypobaric normoxic environment.** Jim A. Stunkard, Jerome P. Schmidt, and Joseph T. Cordaro (USAF, School of Aerospace Medicine,

Brooks AFB, Tex.). *Aerospace Medicine*, vol. 41, Aug. 1970, p. 873-875. 10 refs.

Study of the effect of continuous exposure to a simulated space cabin environment for periods up to 30 days on resistance to systemic bacterial infection. Male mice were used in the tests. Environmental conditions maintained included a barometric pressure equivalent to an altitude of about 19,000 ft, temperature of  $23 \pm 1$  C, relative humidity of  $50 \pm 10\%$ , oxygen concentration of  $44 \pm 1\%$ , and less than 1% carbon dioxide. It is pointed out that from the limited information available it is impossible to draw general conclusions but that the data obtained suggest that utilization of normoxic atmospheres may be less hazardous than either hypoxic or hyperoxic environments. G.R.

**A70-39432 \*** **Reproducibility of ulnar resonant frequency measurement.** John M. Jurist (Wisconsin, University, Madison, Wis.) and Anthony M. Dymond (California, University, Los Angeles, Calif.). *Aerospace Medicine*, vol. 41, Aug. 1970, p. 875-878. 11 refs. PHS Grant No. 5T1-GM-796; Grant No. NGR-50-002-051.

Study of the reproducibility of ulnar resonant frequency for its use as an objective measure of skeletal status. The effects of wrist and elbow flexion, forearm rotation, tension of the forearm muscles, forearm edema, accelerometer contact pressure and position on the wrist, and driver position of the elbow are investigated. Factor analysis attributed 54% of the variance to accelerometer placement, and 37% to elbow positioning. Day-to-day reproducibility was within 7% on normal subjects. It is concluded that forearm and hand positioning is of critical importance in reliably determining the frequency of maximum acceleration response. G.R.

**A70-39433 #** **Portable self-powered system for the rapid measurement of blood electrolytes during aeromedical evacuation.** Marion J. Stansell and Shelby J. Stansell (U.S. Air Force Academy, Colorado Springs, Colo.). *Aerospace Medicine*, vol. 41, Aug. 1970, p. 879-884. 13 refs.

Description of a system for the rapid analysis of blood electrolytes which is compact, battery operated, readily portable, completely self-contained and requires only small quantities (25 microliters of plasma) of sample. The entire analytic operation from blood collection to final readout can be accomplished in seven min. The system appears to be suitable not only for use in aeromedical evacuation but also should be valuable in emergency field hospitals, on hospital wards, or in any situation where portability and freedom from gas supplies and external electric power are required. G.R.

**A70-39434** **Effect of environmental pressure on biological stress from vibration.** R. C. Armstrong, J. P. McCann, D. W. Vorbeck, L. L. Short, and C. H. Purdy (General Dynamics Corp., Convair Div., San Diego, Calif.). (*Aerospace Medical Association, Annual Scientific Meeting, 40th, San Francisco, Calif., May 5-8, 1969.*) *Aerospace Medicine*, vol. 41, Aug. 1970, p. 885-890. 11 refs.

Sprague-Dawley rats were exposed to constant conditions of head-to-tail sinusoidal vibrations at different total environmental air pressures. The experimental data disclosed that animal mortality for identical conditions of vibration exposure was significantly changed by varying the total pressure. These results showed close agreement with anticipated results derived through theoretical considerations which predicted that resonant frequencies and restoring forces developed in vibrating chest-abdomen tissues of air-breathing animals would be highly dependent upon pulmonary gas pressure. These tests indicate that stresses from vibrations in the resonant frequency range of the thoraco-abdominal system of animals may be effectively attenuated by controlled manipulation of atmospheric pressure. The study suggests that research be conducted to define vibration tolerances and resonant frequencies of the thoraco-abdominal system of man at different total environmental pressures to provide guidelines for programming cabin and/or suit pressure profiles which minimize crew stresses. (Author)

**A70-39435 #** **Analysis of the Frank orthogonal vectorcardiogram during gravitational stress.** George H. Cohen, William K. Brown, Darwell E. Stowe, Edward L. Fitzpatrick, and Douglas Threatt (USAF, School of Aerospace Medicine, Brooks AFB, Tex.). *Aerospace Medicine*, vol. 41, Aug. 1970, p. 891-896. 16 refs.

Frank orthogonal vectocardiograms were obtained on 15 healthy subjects during exposure to +Gz and +Gx acceleration. Maximum vector angles of QRS and T loops were determined in the frontal, right sagittal and transverse planes on a beat-by-beat real time base, using analog-digital conversion and a specifically written logic program for the digital computer. Analysis of the data output by standard analysis of variance techniques revealed significant shifts of the maximal QRS vector angle in the transverse and right sagittal planes during +Gz acceleration which appear to be related to changes in cardiac position during acceleration stress. Frontal plane QRST angle changes were noted supporting previous observations using scalar electrocardiography during the hypergravic state. Application of analog-digital computer techniques makes representation of beat-by-beat real time ECG vectors a potentially useful tool in the study of dynamic stress environments. (Author)

**A70-39436** **Metabolic response to acceleration in man.** Richard L. Lipman, Frode Ulvedal, William K. Brown, S. D. Leverett, Frank R. Lecocq, and Joel J. Schnure (USAF, School of Aerospace Medicine, Brooks AFB; USAF, Medical Center, San Antonio, Tex.). *Aerospace Medicine*, vol. 41, Aug. 1970, p. 905-908. 11 refs.

The glucose analogue 2-deoxy-D-glucose (2-DG) was used as a means of producing intracellular hypoglycemia in eight normal male volunteer subjects during a control period, immediately following their initial exposure to acceleration (acute acceleration) and following a fourth acceleration exposure (chronic acceleration). Plasma glucose, free fatty acids, serum immunoreactive growth hormone, plasma cortisol and urinary epinephrine and norepinephrine were measured prior to and following the infusions of 2-DG. There were significant depressions in glucose, urinary epinephrine, cortisol and free fatty acids following acceleration that were not seen when compared to basal, unprovoked levels. Even with the modest acceleration stresses used in this study discernible changes in gluco-regulatory hormone reserves were uncovered. (Author)

**A70-39437 #** **Vacuum distillation-vapor filtered, catalytic oxidation for water reclamation using radioisotopes for thermal energy.** C. A. Metzger, A. B. Hearld, B. McMullen, and M. W. Schelle (USAF, Aerospace Medical Research Laboratories, Wright-Patterson AFB, Ohio). *Aerospace Medicine*, vol. 41, Aug. 1970, p. 909-914. 6 refs.

The design, development and evaluation of an in-house developed vacuum distillation-vapor filtered water recovery process are discussed. The process subjects the vapors (after distillation at low pressure) to catalytic oxidation and uses radioisotopes to obtain the thermal energy for both the distillation and catalytic oxidation. Two 32-day tests and one 42-day test produced bacteria-free, potable water. The results of this research effort on a process for reclaiming potable water from human waste (urine and condensate) has aerospace application and is considered a technological breakthrough. (Author)

**A70-39438** **Multiple choice rotation chair.** Erik Fluor (Karolinska Hospital, Stockholm, Sweden). *Aerospace Medicine*, vol. 41, Aug. 1970, p. 921-924. 5 refs.

Description of a new type of multiple choice rotation chair, suited for advanced clinical experimental research and making it possible to study all the semicircular canals and the otolith organs. The chair is also suitable for testing pilots. The chair is mounted on a slide movable on two tubes, on which it can be displaced 1 m out toward the periphery, where it can be turned 90 deg around the vertical axes in both directions. The horizontal semicircular canals are stimulated in the central position of the chair, the vertical canals

through an eccentric position of the body and the chair lowered 80 deg backward. In supine position the subject experiences rotatory nystagmus and in the horizontal side position he gets vertical nystagmus. G.R.

**A70-39439 \*** Evaluation of antimotion sickness drugs - A new effective remedy revealed. Charles D. Wood and Ashton Graybiel (U.S. Naval Aviation Medical Center, Aerospace Medical Institute, Pensacola, Fla.). *Aerospace Medicine*, vol. 41, Aug. 1970, p. 932, 933. 7 refs. NASA-sponsored research.

Three single drugs (one used in three dosage levels) and three drug combinations were compared in their effectiveness to prevent motion sickness under standardized stress conditions in a slow rotation room. An unexpected finding was that a combination of promethazine 25 mg with d-amphetamine 10 mg had the same range of effectiveness as that found in earlier studies (and confirmed here) for scopolamine 0.6 mg plus d-amphetamine 10 mg. When scopolamine was tested alone, halving the 'usual' dose (0.6 mg) reduced its effectiveness about one-fifth and doubling the usual dose increased effectiveness by 29 per cent; thus the optimum dose of scopolamine appeared to be approximately 0.5 mg. Betahistine hydrochloride (4 mg) was ineffective and cinnarizine (50 mg) was of small benefit.

(Author)

**A70-39440** Air transport of patients in respiratory failure. Richard B. Byrd, J. Robert Burns, and Wilbert H. McElvain (USAF, Medical Center, Scott AFB, Ill.). *Aerospace Medicine*, vol. 41, Aug. 1970, p. 934-937.

Discussion of the general principles employed in the air transport of patients in cases of respiratory failure taking into account the adaptation of equipment for use on the aircraft. It is pointed out that considerable experience has been gained in this regard over the last two years at the Air Force aeromedical evacuation center. The techniques described have been individualized to the patient, some being managed with low flow oxygen and others with pressure or volume cycled respirators. The importance of following the patient's status with arterial blood gases as well as with the cardiac monitor in flight is emphasized. G.R.

**A70-39441** Contingency transfer system. D. L. Curtis (Litton Systems, Inc., Beverly Hills, Calif.). *Aerospace Medicine*, vol. 41, Aug. 1970, p. 946, 947.

A portable, contingency transfer, life support system is being developed for NASA-MSC that may be used on future Apollo missions. As designed, the lightweight emergency system will provide both oxygen and cooling to a crewman in the event that a contingency space walk is required between the ascent stage and the command module resulting from a docking failure. The design effort has resulted moreover, in certain innovative features that could as well be applied to systems designed for missions of much longer duration. The 45-minute unit weighs slightly over 16 pounds charged, and includes as design features a continuously variable cooling system, a nonclogging, high performance sublimator, a gas-driven pump for circulating coolant water through the crewman's liquid cooling garment, water and oxygen status gauges for monitoring expendables, and a breathing vest that allows a major reduction in the oxygen flow requirements to the suit helmet. (Author)

**A70-39491** Fragmentation of a geometrical figure viewed under intermittent illumination. David J. Piggins (Guelph, University, Guelph, Ontario, Canada). *Nature*, vol. 227, Aug. 15, 1970, p. 730, 731. 12 refs.

Description of a method for producing and studying fragmentation of geometrical figures by viewing it under intermittent illumination. The preliminary findings obtained indicate that the amount of fragmentation is dependent on the frequency of presentation. The method described may provide a means for investigating temporal factors underlying the fragmentation phenomenon. Z.W.

**A70-39492 \*** Algae thrive under pure CO<sub>2</sub>. Joseph Seckbach, Frank A. Baker (California, University, Los Angeles, Calif.), and Peter M. Shugarman (Southern California, University, Los Angeles, Calif.). *Nature*, vol. 227, Aug. 15, 1970, p. 744, 745. 10 refs. NASA-USAF-supported research.

Study of the growth and photosynthesis of the unicellular hot spring acidophilic alga *Cyanidium cadarium* cultured in pure CO<sub>2</sub>. It is found that both the volume of the packed cells and the oxygen production were significantly higher in the CO<sub>2</sub> treated cultures. The adaptation period for this alga under pure CO<sub>2</sub> may decrease the growth rates during the first days. Z.W.

**A70-39532 \* #** Measurement and analysis of pilot scanning behavior during simulated instrument approaches. D. H. Weir and R. H. Klein (Systems Technology, Inc., Hawthorne, Calif.). *American Institute of Aeronautics and Astronautics, Guidance, Control and Flight Mechanics Conference, Santa Barbara, Calif., Aug. 17-19, 1970, Paper 70-999*. 12 p. 13 refs. Members, \$1.25; nonmembers, \$2.00. Contract No. NAS 2-3746.

Experimental measurements of pilot scanning and control response in a simulated instrument approach are reported. Airline pilot subjects flew ILS approaches in a six degree of freedom fixed-base DC-8 simulator at the NASA Ames Research Center. A conventional instrument panel and controls were used, with simulated vertical gust and glide slope beam bend forcing functions. Pilot eye fixations and scan traffic on the panel were measured using a recently developed eye-point-of-regard (EPR) system. Simultaneous recordings were made of displayed signals, pilot response, and vehicle motions. The EPR data were reduced for 31 approaches with a cross section of subjects to obtain dwell times, look rates, scan rates, and fractional scanning workload. Flight director (zero reader) approaches as well as standard localizer/glide slope (manual) approaches were made. The scanning results showed the attitude and glide slope/localizer instruments to be primary in a manual ILS approach, sharing 70 to 80 per cent of the pilot's attention. The glide slope/localizer instrument required shorter dwell times with a fixed instrument sensitivity. Differences in dwell time between pilots occurred mainly on the attitude instrument. With the flight director, glide path deviation errors were reduced and the flight director instrument dominated pilot attention (about 80 per cent). There were no apparent circulatory scanning patterns in any of the approaches. These EPR results were generally consistent with prior data where meaningful comparisons could be made. (Author).

**A70-39625 \*** Unusual reducing sugar from *Coccidioides immitis*. E. Scheer, T. Terai, S. Kulkarni, N. F. Conant, R. W. Wheat, and E. P. Lowe (Duke University, Durham, N.C.; U.S. Army, Fort Detrick, Frederick, Md.). *Journal of Bacteriology*, vol. 103, Aug. 1970, p. 525, 526. 10 refs. Army-NASA-supported research; PHS Grants No. AI-01659; No. AI-08359.

Description of documentation for the identification of 3-O-methyl-mannose as one of several neutral sugars found in defatted arthrospore and mycelial cell walls of *Coccidioides immitis*. This is the first identification of 3-O-methyl-mannose as a constituent of a fungal polysaccharide. M.M.

**A70-39674** Delayed feedback in steering during learning and transfer of learning. Karl U. Smith and Harvey M. Sussman (Wisconsin, University, Madison, Wis.). *Journal of Applied Psychology*, vol. 54, Aug. 1970, p. 334-342. Research supported by the Social and Rehabilitation Administration and NSF.

The present study compares accuracy in steering behavior as a characteristic mode of dynamic self-generation of stimuli by movement, with stimulus tracking in which response guidance is determined primarily by movements of environmental stimuli. Breath-generated variations in a visual target were used to measure steering. The hypotheses were that learning in tracking the respiration-generated targets would proceed more rapidly than that of tracking an environmental stimulus and that transfer of performance with the self-generated targets also would be superior. Results based on exact calibration of the equality of error control of the two modes of tracking confirmed these assumptions. An additional finding was that steering and stimulus tracking were differentially affected in the learning and transfer trial series by manual-visual feedback delays between 0.0 and 1.5 secs. The results are explained theoretically by the assumption that steering reactions involved built-in stereotypical spatial and temporal coordinations between eye, hand, and body movements which were not present in the stimulus tracking.

(Author)

**A70-39675** Effects of level and rate of body surface cooling on psychomotor performance. Harold O. Kiess and John M. Lockhart (U.S. Army, Pioneering Research Laboratory, Natick, Mass.). *Journal of Applied Psychology*, vol. 54, Aug. 1970, p. 386-392. 7 refs.

Twenty-four Ss were tested on four psychomotor tasks at four levels of mean weighted skin temperature (MWST) attained at two different rates while normal hand skin temperatures were maintained. MWSTs employed were: 85, 78, 74, and 70 F, attained after either 15 or 90 min of cooling. The lowering of MWST impaired block stringing (BS) and Purdue Pegboard assembly performance but not knot tying or two plate tapping performance. Rate of cooling was an effective variable only at lower MWSTs and only for the BS task. Subjective ratings of discomfort and task interference due to cold stress were obtained and related to task performance. The Ss tended to overestimate their performance decrements at lower MWSTs. The results suggested that hand warming may preserve psychomotor dexterity despite moderate decrements in MWST.

(Author)

**A70-39712 #** The effects of temporal and spectral combinations on the judged noisiness of aircraft sounds. Karl S. Pearsons and Ricarda L. Bennett (Bolt Beranek and Newman, Inc., Van Nuys, Calif.). *Acoustical Society of America, Spring Meeting, 79th, Atlantic City, N.J., Apr. 21-24, 1970, Paper*. 16 p. FAA-supported research.

Determination of the judged noisiness of stimuli varying both temporally and spectrally, by subjecting twenty college students to tests performed in an anechoic chamber. The investigations were divided into three test stimuli test series. The first test series used thirty stimuli with six different time patterns and five different spectra. The second test used stimuli selected from the first test but modified to include signal durations ranging from 1 to 100 sec. Duration in this case is the amount of time the stimuli were within 10 dB of the maximum level. The stimuli for the third test consisted of recordings of turboprop, turbofan, turbojet and helicopter flyovers. The results indicated that the most accurate predictor of the judged noisiness was perceived noise level using a tone correction suggested by the FAA and an integrated measure of duration. Z.W.

**A70-39713** Comparison of indicator components and push-button recommendations. J. B. Chambers and H. C. W. Stockbridge (Army Personnel Research Establishment, Farnborough,

Hants., England). *Ergonomics*, vol. 13, July 1970, p. 401-420. 34 refs.

Four consoles were designed identical in every respect except for the display and control components used in their construction. Two levels of illumination were employed. Sixteen fit male subjects, age range 19 to 50, were tested. Subjects were asked to respond to signals presented in a predetermined order by operating a control, e.g., a push-button or Post Office key. Reaction times were taken using a simple time event recorder producing five-hole punched paper tape output. A note was taken of errors of operation. Some 30,000 reaction times were taken and analyzed using a five-factor analysis of variance computer program. A similar rank order of the components was found for speed of response and accuracy of operation. Within the limits of the experiment a transilluminated push-button was operated with the lowest reaction time and with least error. Some factors affecting the design of push-button controls and their associated displays are discussed.

(Author)

**A70-39714** The effects of hypoxia on choice reaction time and movement time. F. Ledwith (St. Andrews University, St. Andrews, Scotland). *Ergonomics*, vol. 13, July 1970, p. 465-482. 27 refs. Research supported by the Reserve Bank of Australia.

An investigation was made of the effects on choice reaction time and movement time of hypoxia (oxygen deprivation) induced by a reduction in total air pressure inside a decompression chamber. The subjects were adult humans who were given no pretraining on the task used, were tested once at a pressure level equivalent to some altitude between ground level and 15,000 ft, and were given no information on the altitude attained. A variety of tasks were used with simple and complex spatial and code relationships between stimulus and response. In three experiments on 92 subjects in all the most consistent finding was that from ground level to 7000 ft or 10,000 ft there was a significant increase in reaction time and a significant decrease in movement time. Above 10,000 ft the results were less consistent, reaction time showing further increase or a decrease to that found at ground level and movement times varying in the opposite direction to these changes. It was suggested that in young adult subjects and in tasks of low 'mental load' the inverse variation of reaction time and movement time was quite consistent and was possibly a result of an unimpaired total response time plus a selective impairment of the time taken to initiate a response found only at intermediate altitudes. In tasks with more 'mental work' involved, hypoxic impairment of total response time was found at altitudes as low as 5000 ft. Above 10,000 ft there was little further impairment, possibly as a result of some compensatory adjustment in drive or arousal level which might also have been the reason for the lack of impairment of reaction time at the highest altitudes in the simple tasks. The great discrepancy between these results and previous literature, and the additional finding of quicker response times with prolonged exposure to the experimental conditions, were attributed to the separate analysis of reaction time and movement time and the use of naive subjects in a novel experimental design.

(Author)

**A70-39764 #** Imaginary phenomenal-space axes in distance contrast illusions ('Voobrazhaemye' osi fenomenal'nogo prostranstva v kontrastnykh illiuziakh rasstoianii). Z. I. Khodzha (Akademiia Nauk Gruzinskoi SSR, Institut Psikhologii, Tiflis, Georgian SSR). *Akademiia Nauk Gruzinskoi SSR, Soobshcheniia*, vol. 58, May 1970, p. 489-492. In Russian.

Study of the space-structuring effects of a fixed point in a field of vision. It is shown that a fixed point organizes a field of vision and divides it into meaningful parts. It divides it into upper and lower parts and each of the latter into right-hand and left-hand parts. This implies that some definite reference lines or coordinate axes, created in the imagination, are crossing the fixed point in the field of vision and establish some space and distance relations with other points in

the field. It is also shown that the perception of these space and distance relations results in distance contrast illusions. Thus, the imagined coordinate axes of the phenomenal space, growing out of a fixed point in the field of vision, have obviously definite space-structuring effects in the imagination. It is felt that there is no other experimental method in psychology which can reveal the effects of imaginary coordinate axes more directly and adequately than the demonstrated distance contrast illusions. M.V.E.

**A70-39774 \*** Induction of lambda prophage by nalidixic acid. John Cowlshaw (Oakland University, Rochester, Mich.) and William Ginoza (Pennsylvania State University, University Park, Pa.). *Virology*, vol. 41, June 1970, p. 244-255. 43 refs. AEC Contract No. AT (30-1)-3116; Grant No. NGR-39-009-008.

Study of the kinetics of induction of lambda prophage by nalidixic acid (NAL), an apparently specific and reversible inhibitor of DNA synthesis. NAL was found to cause inducing conditions in an exponentially growing culture of *Escherichia coli* W3350 (lambda). Its inhibition of DNA synthesis leads to some inducing event in the cells. The kinetics of induction indicate that: (1) the inducing event occurs in some cells immediately upon exposure to NAL; (2) the number of inducing events in a population of cells is proportional to the length of NAL treatment; (3) this rate is larger, the higher the concentration of NAL; (4) the induction rate is 7-fold greater for lysogens bearing the thermosensitive and UV-induction-sensitive prophage lambda t1; (5) amino acid starved lysogens are poorly induced; (6) prolonged treatment with NAL causes progressive inactivation of plaque-forming ability of cells potentially induced by shorter treatments of NAL, an effect probably caused by the deleterious effect of NAL on phage DNA synthesis itself; and (7) concomitant protein synthesis is necessary to obtain induction with NAL. The results suggest that a population of cells is not homogeneous in its sensitivity to NAL. It is proposed that this inhomogeneity is closely related to the cyclical variation in DNA replication among individual cells, and that abnormal termination of chromosome replication by NAL mal-triggers the normal terminal functions, during which event the cell is irreversibly converted to the induced state. M.V.E.

**A70-39824 #** Dynamics of postradiation damage of biological objects (Dinamika postradiatsionnoi gibeli biologicheskikh ob'ektov). I. B. Bychkovskaia. Moscow, Atomizdat, 1970. 201 p. 498 refs. In Russian.

The dynamics of postradiation damage are studied in different animals over a wide range of successively increasing radiation doses. A general pattern of post radiation necrosis in populations is established for different biological species; this pattern is expressed by a power law relationship between the duration of damage and the radiation dose. It is shown that this relationship is caused by unequal sensitivities of critical systems to radiation and by different rates of damage growth. Mechanisms responsible for these effects are outlined, and their significance in the pathogenesis of radiation sickness is evaluated. Significant attention is given to systemic radiation damage in mammals (myeloid, gastrointestinal, and cerebral syndromes). Possibilities of planned treatment to affect the dynamics of postradiation damage are discussed, and practically important data are given for the differential effects of various radiation-protection measures. The analysis of radiation damage by the lethality criterion is examined; it is shown that disregard for the exponential nature of damage growth can lead to significant errors in the analysis of the results of medical examinations. T.M.

**A70-39879 #** On the effect of individual elastic properties of the human body on the results of arterial pressure measurements (O vliianii individual'nykh uprugikh svoistv chelovecheskogo tela na rezul'taty izmerenii arterial'nogo davleniia). V. Ol'shak and E.

Zavidskii. In: Problems of the mechanics of a solid deformed body (Problemy mekhaniki tverdogo deformirovannogo tela). (A70-39851 20-32) Edited by L. I. Sedov. Leningrad, Izdatel'stvo Sudostroenie, 1970, p. 309-313. In Russian.

Qualitative analysis of individual deviations of the response of the Riva-Rocci sphygmomanometer from the actual arterial pressure. Based on a simplified model for measuring blood pressure by means of the Riva-Rocci instrument, an analytical solution is obtained giving the relationship between the inner pressure in the artery and the pressure applied as a function of the value of the coefficient of elasticity. The resulting deviations are discussed. O.H.

**A70-39905 #** Statistical studies of process in the blood circulation system (O statisticheskikh issledovaniakh protsessov sistemy krovoobrashcheniia). B. Siuch and E. Monosh. In: Identification and equipment for statistical investigations; All-Union Symposium for Statistical Problems in Technical Automation, 1st, Moscow, USSR, February 14-18, 1967, Proceedings (Identifikatsiia i apparatura dlia statisticheskikh issledovani; Vsesoiuznyi Simpozium po Statisticheskim Problemam v Tekhnicheskoi Kibernetike, 1st, Moscow, USSR, February 14-18, 1967, Trudy). (A70-39901 20-08) Edited by V. S. Pugachev. Moscow, Izdatel'stvo Nauka, 1970, p. 80-84. 5 refs. In Russian.

Analysis of the dynamic characteristics of the cardiovascular system by methods employed in linear correlation analysis. A test is described, using which the weighting function of the cardiovascular system can be determined. Changes in the dynamic structures of the organism are investigated by studying the response of the dynamic properties of the system studied to the state of the nervous system or the hormonal medium. Some results obtained by the method proposed are examined. The schematic circuit of the test is given and discussed. V.P.

**A70-39981 \*** Hemolysis near an ultrasonically pulsating gas bubble. James A. Rooney (Vermont, University, Burlington, Vt.). *Science*, vol. 169, Aug. 28, 1970, p. 869-871. 12 refs. NIH Grant No. GM-08209; Grant No. NSG(T)-28-S3.

A small volume of an erythrocyte suspension was subjected to the action of a manipulated gas bubble set into stable oscillation at 20 kilohertz. Release of hemoglobin occurred when the oscillation amplitude exceeded a critical threshold. Hydrodynamic stresses resulting from acoustically induced small-scale eddying motion near the bubble may be the mechanism of hemolysis. (Author)

**A70-40025** Subjective symptomatology and cognitive performance at high altitude. David A. Stamper, Robert A. Kinsman (Fitzsimons General Hospital, Denver, Colo.), and Wayne O. Evans (U.S. Army, Research Institute of Environmental Medicine, Natick, Mass.). *Perceptual and Motor Skills*, vol. 31, Aug. 1970, p. 247-261. 10 refs.

Further standardization of the General High Altitude Questionnaire (GHAQ) for use in quantifying the severity of Acute Mountain Sickness is described. The results show, as did an earlier study, the questionnaire reliably reflects changes in symptom severity. The amount of decrement on a number of psychomotor tasks was directly related to the degree of severity of the subjective symptomatology of Acute Mountain Sickness. The results also showed several conceptually clear symptom clusters of the GHAQ that appear to reflect different states of subjective symptomatology. (Author)

**A70-40069** Correlation between electrocardiographic changes and systemic hemodynamics in human arterial hypertension. Rune Sannerstedt, Jan Bjure, and Ed Varnauskas (Sahlgrenska



Hospital, Göteborg, Sweden). *American Journal of Cardiology*, vol. 26, Aug. 1970, p. 117-122. 21 refs. Research supported by the Swedish National Association Against Heart and Chest Diseases.

Experimental investigation in which electrocardiographic findings at rest of 57 men, between the ages of 17 and 64 years, with systemic arterial hypertension of various degrees of severity, were related to systemic hemodynamics at rest and during standardized exercise in the sitting position. The hemodynamic findings were compared with corresponding data from 59 normotensive control subjects. In classifying the electrocardiographic appearance into 4 different groups according to the presence and degree of changes indicating left ventricular hypertrophy, the presence of T wave changes rather than the height of R waves was emphasized. There was a close correlation between the classification of the degree of electrocardiographic changes indicating left ventricular hypertrophy and the level of the systemic vascular resistance or intra-arterial blood pressure at rest. The group of hypertensive men with completely normal electrocardiograms was characterized by increased cardiac output, heart rate and oxygen consumption at rest, whereas the systemic vascular resistance was not different from that of the control subjects. The presence of a negative T wave in lead aVL as the only abnormal electrocardiographic finding resulted in the hemodynamic pattern characteristic of established arterial hypertension with a normal cardiac output and increased systemic vascular resistance at rest. M.M.

**A70-40075 \*** Electron microscope studies on aging *Drosophila melanogaster*. I. Akira Takahashi, Delbert E. Philpott, and Jaime Miquel (NASA, Ames Research Center, Moffett Field, Calif.). *Journal of Gerontology*, vol. 25, no. 3, 1970, p. 210-217. 17 refs. NASA-supported research.

Electron microscope study of the flight muscle of senescent *Drosophila melanogaster*. The study has shown electron-dense bodies identified as mitochondria in various stages of degeneration. Dense bodies, possibly related to mitochondria, have also been observed in goblet cells, oenocytes, and fat body of senescent flies. M.M.

**A70-40125 #** Comment on weight loss during manned space missions. L. Davies (Ministry of Technology, National Physical Laboratory, Teddington, Middx., England). *British Interplanetary Society, Journal*, vol. 23, Sept. 1970, p. 651-655.

Discussion of the validity of the conclusions made by the Dombal in his recent study on weight loss by astronauts during manned space missions. In this study, the weight lost by astronauts in spaceflight, originally considered to be independent of mission duration, is shown to be simply related to this time. If the relationship is linear as suggested, the consequences could be serious for extended duration flights. A reexamination of the available weight-loss data from the American and Russian manned space missions is therefore made and an alternative to the Dombal's equation for weight loss as a function of the time spent in space is produced. A comparison between these equations and the data is made, and it is shown that the Dombal's equation has a very limited range of applicability. It is further suggested that his equation is overpessimistic regarding the weight loss to be expected from extended-duration space flights. O.H.

**A70-40171 #** Nature of the paradoxical phase of sleep (O prirode paradoksal'noi fazy sna). T. N. Oniani, T. L. Naneishvili (Akademiia Nauk Gruzinskoi SSR, Institut Fiziologii, Tiflis, Georgian SSR), and P. Mol'nar. *Fiziologicheskii Zhurnal SSSR*, vol. 56, May 1970, p. 689-695. 21 refs. In Russian.

Experimental study of the characteristics of the desynchronized or paradoxical phase of sleep in cats, using spectral analysis of electroencephalograms and eye motion measurements. It is shown

that this phase of sleep can be divided into three separate stages differing by a number of neurophysiological factors. A stage of general activation or desynchronization of the slow electrical activity in all brain structures is probably caused by an excitation of the reticular formation. A stage of hippocampal theta rhythm predominance is caused by excitation of inclination centers in the hypothalamus, while a stage of hippocampal delta rhythm predominance is associated with the excitation of hypothalamic centers which inhibit inclination. T.M.

**A70-40172 #** Dependence of the impulsive reactions of inferior calliculus neurons on the time constant of a sound signal (Zavisimost' impul'snykh reaktsii neuronov zadnikh kholmov ot postoiannoi vremeni zvukovogo signala). I. A. Vartanian and V. I. Snetkov (Akademiia Nauk SSSR, Institut Fiziologii, Leningrad, USSR). *Fiziologicheskii Zhurnal SSSR*, vol. 56, May 1970, p. 696-706. 23 refs. In Russian.

Experimental data for differences in the impulsive reactions and frequency response of two extreme groups of neurons in rats under the action of short, long, and amplitude varying sound signals. It is shown that with larger time constants of the sonic stimulation the number of pulses in the discharge of the first neuron group decreases and the duration of latent periods sharply increases, particularly at near-threshold intensities and optimal frequencies. The impulsive reaction thresholds of these neurons are unaffected by the signal time constant. In the second neuron group, there are no changes in the discharge or latent period duration but there is a clear increase in reaction threshold for increasing time constants. T.M.

**A70-40173 #** Mechanism of the constrictive effect of high-temperature blood on the arteries (O mekhanizme konstruktornogo deistviia krovi povyshennoi temperatury na arterial'nye sosudy). I. A. Manuilov (Akademiia Nauk SSSR, Institut Fiziologii, Leningrad; Institut Fizicheskoi Kul'tury, Omsk, USSR). *Fiziologicheskii Zhurnal SSSR*, vol. 56, May 1970, p. 742-750. 45 refs. In Russian.

Experimental study of the reactions of blood vessels in the rear limbs, small intestine, and spleen of a dog to the action of arterial blood whose temperature was artificially increased from 2 to 2.5 deg above the rectal temperature (a temperature difference which can arise during intense muscular activity). The thermal stimulation caused constriction of the vessels which was most pronounced at the extremities. The constrictive effect was conserved during rhythmic contractions of muscles but was less pronounced. Administration of dihydroergotoxin does not prevent the constrictive effect, and this testifies to the myogenic nature of the phenomenon. Presumably, thermal vasoconstriction may be a local mechanism participating in the compensatory constriction of vessels during intense muscular activity. T.M.

**A70-40174 #** Influence of impulses of skeletal musculature proprioceptors on the functional properties of the respiratory center (O vliianii impul'sov proprioretseptorov skeletnoi muskulatury na funktsional'nye svoistva dykhatel'nogo tsentra). V. I. Kozlova (Meditsinskii Institut, Orenburg, USSR). *Fiziologicheskii Zhurnal SSSR*, vol. 56, May 1970, p. 759-763. 19 refs. In Russian.

Experimental study of the influence of the static tension of skeletal muscles on the character of external respiration and functional properties of the respiratory center in dogs. Data indicate increased frequency and volume of respiration as well as increased sensitivity of the respiratory center to afferent stimulation under static tension of skeletal muscles. These effects persist for approximately 6 min after removal of the load on the muscles. T.M.

**A70-40175 #** Recording of human respiration in a pressure chamber (Registratsiia dykhaniiia cheloveka v barokamernom eksperimente). I. S. Breslav, B. N. Bolkov, and V. M. Mitushov (Akademiia Nauk SSSR, Institut Fiziologii, Leningrad, USSR). *Fiziologicheskii Zhurnal SSSR*, vol. 56, May 1970, p. 805-807. In Russian.

Description of spiograph equipment which permits external measurement of respiration activity for a subject contained in a pressure chamber and exposed to different pressures and mixture compositions. The equipment automatically compensates for the pressure differences between the chamber and its surroundings by using a duct with special valves between the external spiograph and the breathing mask in the chamber. The operation of the valves is based on the partial vacuum created during inhalation. The external spiograph registers minute and respiratory volumes at atmospheric pressure. T.M.

**A70-40184 #** Investigation of water exchange in the biological life support system based on the algobacterial culture (Issledovanie vodoobmena v biologicheskoi sisteme zhizneobespecheniia na osnove algo-bakterial'noi kultury). I. I. Gitel'zon, I. A. Terskov, B. G. Kovrov, V. N. Belianin, G. M. Lisovskii, R. I. Kuz'mina, Iu. N. Okladnikov, and M. S. Rerberg. *Kosmicheskaiia Biologiia i Meditsina*, vol. 4, May-June 1970, p. 3-8, 10 refs. In Russian.

The paper discusses the experimental data on water exchange in the biological life support system involving man and *Chlorella* with the concomitant microflora. It evaluates water sources within the system that can be used to meet human requirements. The technological scheme of water exchange of the man-algobacterial culture system was used in long-term experiments in which atmosphere and partially water were regenerated. The water reclamation parameters found in the experiment allowed an evaluation of water reclamation and methods for its improvement in the biological life support system. (Author)

**A70-40185 #** Application of hyperoxic and hypercapnic gas mixtures to increase orthostatic tolerance (Ispol'zovanie giperoksicheskogo-giperkapnicheskikh gazovykh smesei dlia povysheniia ortostaticheskoi ustoiichivosti). V. I. Korol'kov, B. B. Egorov, and I. Ia. Lunev. *Kosmicheskaiia Biologiia i Meditsina*, vol. 4, May-June 1970, p. 8-12, 27 refs. In Russian.

It was found that breathing of gas mixtures containing higher concentrations of oxygen and carbon dioxide favorably affected tolerance to 15 min tilt tests. The orthostatic tolerance declined in response to hypovolemia due to blood loss of 0.8% body weight. If the test animals were breathing gas mixtures containing 5% CO<sub>2</sub>, 93% O<sub>2</sub> and 2% N<sub>2</sub> under the hypovolemic conditions, no collapse states developed. (Author)

**A70-40186 #** Combined effect of acute hypoxia and high ambient temperature on animals (Kompleksnoe vliianie na organizm zhivotnykh ostroi gipoksii i vysokoi temperatury okruzhaiushchei sredy). A. V. Sergienko. *Kosmicheskaiia Biologiia i Meditsina*, vol. 4, May-June 1970, p. 13-18, 13 refs. In Russian.

Experiments were carried out to study a combined effect of acute hypoxia increasing at a different rate (2 to 500 m/sec) and ambient temperature (+21, 30, and 40 C) upon the altitude tolerance of animals. The tolerance was evaluated by (1) the 'altitude ceiling' and (2) time of survival of animals at 12,000 m and during simulated ascent at a rate of 2 to 500 m/sec. An increase in the ambient temperature induced a substantial decline of the altitude tolerance due to significant disturbances in the regulatory and compensatory mechanisms resulting from a combined effect of high temperature and hypoxia increasing at a different rate. This rate is of particular biological importance for the tolerance to acute hypoxia and high ambient temperature: an increase in the decompression rate caused a rise of the 'altitude ceiling' and a progressive decrease of the time of normal activity maintained and survival at an altitude of 12,000 m. (Author)

**A70-40187 #** Dynamics of changes in protein metabolism in rats during prolonged hypokinesia (O dinamike izmenenii belkovogo obmena u krys v techenie dlitel'noi gipokinezii). I. V. Fedorov, Iu. I. Milov, and E. E. Simonov. *Kosmicheskaiia Biologiia i Meditsina*, vol. 4, May-June 1970, p. 18-21, 5 refs. In Russian.

Study of the effect of prolonged immobilization on the rate of protein synthesis in rats. The rate of synthesis of tissue protein in rats immobilized in special devices was determined by Fedorov's method, using triptophan-1-C-14 instead of methionine. In addition, changes in the body weight of the animals were determined, as well as the weight of individual organs, the total nitrogen content in skeletal muscle tissue, and the transaminase activity of the blood serum. It is established that in rats immobilized for 60 days under the conditions of the experiment none of the indices characterizing protein metabolism showed any tendency to normalization of metabolic processes. It is concluded that during prolonged and fairly total hypokinesia of rats the animals cannot be expected to show an adaptation of their organisms to this state. A.B.K.

**A70-40188 #** Morphology of kidneys and neurosecretory substance of the posterior hypophysis of rats after many-hour exposure to transverse accelerations (Morfologiia pochek i neiro-sekretornoi substantsi zadnei doli gipofiza krys posle mnogochasovogo vozdviistviia poperechno napravlennoogo uskoreniia). A. S. Pankova, V. K. Podymov, and E. A. Savina. *Kosmicheskaiia Biologiia i Meditsina*, vol. 4, May-June 1970, p. 21-26, 21 refs. In Russian.

The dynamics of morphological changes in kidneys and variations in the content of the neurosecretory substance in the posterior lobe of the hypophysis were investigated in 40 white male rats exposed to transverse accelerations for 3, 8, 16, and 24 hours. Morphological changes in kidneys and neurohypophysis showed certain parallelism. The ejection of the neurosecretion preceded the development of morphological symptoms that reflected an increased reabsorption of water in kidneys. The intensity of morphological changes in the neurohypophysis kidney system depended on the exposure time. (Author)

**A70-40189 #** Immunobiological reactivity of mice at an altitude of 3000 m (Sostoianie immunobiologicheskoi reaktivnosti myshei, nakhodivshikhsia na 'vysote' 3000 m). A. S. Kaplanskii and G. N. Durnova. *Kosmicheskaiia Biologiia i Meditsina*, vol. 4, May-June 1970, p. 26-29, 6 refs. In Russian.

The state of immunobiological reactivity of mice kept for 16 days in a ventilated altitude chamber with a pressure of 525 mm Hg (equivalent to an altitude of 3000 m) was examined. The phagocytic activity of blood neutrophils and abdominal macrophages as well as the antibody production of mice immunized with a killed typhoid vaccine or Vi-antigen (immunization performed on the 8th day of the exposure) remained normal. The intensity of plasma cell hyperplasia occurring in regional lymph nodes of the immunized animals also remained unaltered. The decline of the lymph node weight observed at the end of the experiment was due to a decrease of the lymphocyte count. (Author)

**A70-40190 #** Electron microscopic study of the structure of the lung alveolar and capillary wall during stress effects (Elektronnomikroskopicheskoe izuchenie stroeniia al'veoliarno-kapilliarnoi stenki legkogo pri ekstremal'nykh vozdviistviakh). R. S. Morozova and N. I. Morokhova. *Kosmicheskaiia Biologiia i Meditsina*, vol. 4, May-June 1970, p. 29-35, 20 refs. In Russian.

The paper presents the results of a comparative electron microscopic examination of the air-blood barrier of the lungs of mammals kept under normal conditions, exposed to transverse accelerations and kept under the conditions of mechanically changed pulmonary circulation. The latter changes are similar to those developing in response to the effect of accelerations. In the norm the

air-blood barrier is continuous, consisting of the alveolar epithelium, capillary endothelium and basal membrane located between them. Under the conditions of transverse accelerations and changed hemodynamics, the structure of the air-blood barrier undergoes significant changes involving an increase of the barrier thickness due to the development of collagen fibrils between the epithelium and endothelium. (Author)

**A70-40191 #** DNA synthesis and rate of bone marrow cell differentiation of dogs exposed to simulated radiation of extended space flights (Sintez DNK i skorost' differentsirovki kletok kostnogo mozga u sobak, podvergaemykh oblucheniiu, modeliruiushchemu radiatsionnoe vozdeistvie pri dlitel'nom kosmicheskom polete). A. V. Iliukhin. *Kosmicheskaya Biologiya i Meditsina*, vol. 4, May-June 1970, p. 36-40. In Russian.

The results of autoradiographic studies of the DNA synthesis and bone marrow cell differentiation of the dogs exposed to prolonged Co 60 lambda-irradiation are given. The irradiation pattern simulated the environment in space cabins during extended space flights. The dogs were irradiated during 12 to 16 months. The tested parameters changed insignificantly and reversibly during single irradiations of the animals with 50 rem. No significant changes in the DNA synthesis or the rate of cell maturation occurred during chronic irradiations of the animals with total doses of 25, 75, and 150 rem per year. (Author)

**A70-40192 #** Comparative evaluation of radiobiological effects of various types of partial protection (Sravnitel'naia otsenka radiobiologicheskikh effektov pri razlichnykh variantakh lokal'noi zashchity tela). Iu. G. Grigor'ev, G. F. Nevskaya, G. M. Abramova, E. V. Ginsburg, and M. P. Kalandarova. *Kosmicheskaya Biologiya i Meditsina*, vol. 4, May-June 1970, p. 40-45. 15 refs. In Russian.

The paper gives the results of studying the efficiency of the partial body protection of dogs irradiated with 250-MeV protons at a minimal absolutely lethal dose (350 rad). With this purpose paraffin blocks were used that shielded 15% of the body - head, chest, upper and lower portions of the abdomen, the pelvic region or hind legs. Partial protection of any portion of the body appeared effective and all experimental animals survived. The effect was most pronounced when the chest and pelvic were shielded. A distinct relationship between the effect of partial body protection and the amount of shielded bone marrow has been revealed. (Author)

**A70-40193 #** Medical monitoring systems in 'Soyuz' spacecraft (Sistemy meditsinskogo kontrolya kosmicheskikh korablei tipa 'Soyuz'). Iu. G. Nefedov, L. I. Kakurin, S. M. Gorodinskii, V. A. Guda, A. D. Egorov, B. B. Egorov, A. G. Zerenin, A. A. Zlatorunskii, V. I. Kozharinov, I. B. Svistunov, and I. S. Shadrintsev. *Kosmicheskaya Biologiya i Meditsina*, vol. 4, May-June 1970, p. 45-51. 6 refs. In Russian.

General principles underlying the medical monitoring system in the 'Soyuz 3, 4, 5' spacecraft are presented. The physiological parameters monitored and information sources used are described. The structural scheme of the medical equipment and biosensors are given. The principles of the equipment design, and accumulation, treatment and analysis of the physiological information are discussed. The layout diagram of the medical monitoring equipment, illustration of the system of biosensors and pattern of telemetric recordings of the physiological parameters are presented. (Author)

**A70-40194 #** Some aspects of medical support of long duration space missions (Nekotorye aspekty lechenno-profilakticheskogo obespecheniya dlitel'nykh kosmicheskikh pole-

tov). G. L. Iaroshenko and V. G. Terent'ev. *Kosmicheskaya Biologiya i Meditsina*, vol. 4, May-June 1970, p. 52-54. In Russian.

Minimum requirements for medical support may be determined on the basis of predicting morbidity of space crews. Most stress factors inherent in space flights occur on the earth, causing disorders in healthy people. Therefore, disturbances and diseases, developing in subjects who long worked in stress conditions or were exposed to simulated stress effects, may be used as the reference data for the pertinent predictions. A method of predicting disturbances and diseases in extended space missions is suggested. The method may help to determine the medical aid required items to be included in space kits and the level of astronaut training in medicine, and to develop recommendations on medical equipment. (Author)

**A70-40195 #** Thermal load used as a functional and diagnostic test in astronaut examination (O primeneniі teplovoi nagruzki v kachestve funktsional'no-diagnosticheskoi proby pri obsledovanii kosmonavtov). E. I. Kuznets and E. V. Iakovleva. *Kosmicheskaya Biologiya i Meditsina*, vol. 4, May-June 1970, p. 55-59. 9 refs. In Russian.

When examining astronauts, it is proposed to expose them to temperatures of about 50 deg at relative humidity of 85-90%, the exposure used as a functional and diagnostic test. The thermal resistance can be assayed on the basis of heart rate, arterial pressure, rectal temperature, water losses, accumulated heat as well as the exposure time. The values of these parameters which are true for the limit of human thermal tolerance are given. (Author)

**A70-40196 #** Preliminary physical training as a factor increasing resistance to water immersion (Predvaritel'naia fizicheskaya trenirovka kak faktor povysheniia ustoychivosti k vozdeistviu vodnoi immersii). Iu. A. Sandalov. *Kosmicheskaya Biologiya i Meditsina*, vol. 4, May-June 1970, p. 59-64. 19 refs. In Russian.

Nine healthy test subjects at the age of 22 to 32 were exposed to a 24 hour water immersion experiment before and after a special physical training which involved various exercises to increase general endurance and strength. It was shown that values of general and static endurance, strength, speed as well as cardiovascular and respiratory responses to maximum speed and dynamic loads were more stable in water immersion experiments that followed physical exercises. (Author)

**A70-40197 #** Effect of cyclic changes of the atmosphere on the man basal metabolism under hypokinetic conditions (Vlieniie tsiklicheskh izmenenii gazovoi sredy na osnovnoi obmen cheloveka pri dlitel'nom ogranichenii dvigatel'noi aktivnosti). G. F. Makarov. *Kosmicheskaya Biologiya i Meditsina*, vol. 4, May-June 1970, p. 64-67. 7 refs. In Russian.

The effect of cyclic changes of the atmosphere on the man basal metabolism under hypokinetic conditions was studied. Two healthy test subjects stayed 35 days in an altitude chamber. The experiment included 5 cycles of 7 days each. On the 3rd day the atmosphere was hypoxic ( $PO_2 = 110$  plus or minus 5 mm Hg), on the 4th day it was hypoxic ( $PO_2 = 110$  plus or minus 5 mm Hg) and hypercapnic ( $PO_2 = 15$  plus or minus 3 mm Hg), on the 7th day it was hyperoxic ( $PO_2 = 320$  plus or minus 10 mm Hg), on the remaining days the normal atmosphere was maintained. The results of the preliminary experiments suggest that cyclic alterations of hypoxia and hypoxia combined with hypercapnia may give a stimulating effect that compensate for a hypokinesia-induced decline of metabolism. (Author)

**A70-40198 #** Effect of reduced diet and hypokinesia on the human tolerance to static loads (Vlieniie ponizhennogo ratsiona pitaniia i ogranicheniia dvigatel'noi aktivnosti na vynoslivost' chelo-

veka k staticheskim napriazheniiam). M. A. Cherepakhin. *Kosmicheskaya Biologiya i Meditsina*, vol. 4, May-June 1970, p. 67-72. 21 refs. In Russian.

Three series of 15 day experiments were conducted using 18 test subjects at the age of 24-37. In all experiments lyophilized products were used that supplied a calorie value of 1800 Kcal/day. In the first experimental series the test subjects performed normal motor activities; in the second series they were kept in bed; and in the third series they remained in bed being exposed to chest-to-back accelerations of 8g for 120 sec before and after the experiment. The above nutrition pattern did not affect human tolerance to static loads, if motor activity remained normal. This nutrition adversely affected the tolerance in the case of bed rest. The human tolerance to accelerations can be assayed and predicted, using provocative static tests that can be performed in small chambers, bed, fixed position, and pressure suit. (Author)

**A70-40199 #** Method of nonsearch ultrasonic Doppler cardiography (Metod bespoiskovoi ul'trazvukovoi Doppler-kardiografii). V. G. Voloshin, V. A. Degtiarev, and A. N. Kozlov. *Kosmicheskaya Biologiya i Meditsina*, vol. 4, May-June 1970, p. 73-75. In Russian.

Description of a method of nonsearch ultrasonic Doppler cardiography, which makes it possible to determine the phases of the cardiac cycle from a curve recorded from the precordial region with the aid of a fixed sensor without special searching of the valves. The device employed for this purpose is a transistorized variant of the Doppler cardio range finder. This device is characterized by small size and weight and is equipped with a wideband filter which ensures the transmission of signals from cardioelements moving at rates ranging from 4 to 30 cm/sec. It is shown that the phase structure determined with the aid of nonsearch ultrasonic Doppler cardiography is completely identical to that determined by other methods, the advantage of the proposed method being that it makes it possible to record a single function at a time and to perform a phase analysis of the diastole. A.B.K.

**A70-40200 #** Permissible error in measuring the basic mass exchange parameters in humans (O dopustimoi pogreshnosti izmereniia osnovnykh parametrov massoobmena cheloveka). Iu. I. Aganin. *Kosmicheskaya Biologiya i Meditsina*, vol. 4, May-June 1970, p. 75-78. In Russian.

Formulation of the requirements on the permissible error in measuring the basic mass exchange parameters in humans in connection with the designing of life-support systems for manned space vehicles. Two examples of the estimation of this error are presented - namely, estimation according to a criterion of minimal cost of the ground experiment, and estimation according to a criterion of minimal weight of the life-support system. A.B.K.

**A70-40269 #** Results of dynamic observation of persons working in the region of influence of a microwave field (Rezultaty dinamicheskogo nabludeniia za litsami, rabotaiushchimi v zone deistviia SVCh polia). S. S. Rogusskii, L. A. Ulitskii, B. N. Bartsevich, A. V. Il'in, and V. N. Krivenko. *Voenna-Meditsinskii Zhurnal*, June 1970, p. 39-41. In Russian.

Results of medical studies of the effects of microwave radiation on maintenance personnel consisting of over 100 men between 19 and 22 years of age. Studies were divided into three stages - prior to irradiation, during work in a microwave field, and after removal from field effects. Measurements included the latent period of respiratory reaction; ability to concentrate attention; content of potassium, calcium, sodium, and protein fractions in the blood; and thrombocyte and reticulocyte counts. No significant changes were observed in the nervous system, mental activity, internal organs, metabolism, or eyesight. The changes which were observed have a functional origin and can be explained by factors other than microwave irradiation. T.M.

**A70-40290 #** State of adaptation to darkness in flight personnel in the north (Sostoianie temnovoi adaptatsii u letnogo sostava na severe). A. I. Mosur and N. F. Lebedev. *Voenna-Meditsinskii Zhurnal*, June 1970, p. 46, 47. In Russian.

Discussion of changes in adaptation to darkness for flight personnel stationed in polar regions for several years. Tables show the percentage of subjects requiring different durations for adaptation at yearly intervals for a three-year period. It is shown that adaptation maintains a high level during fall and winter months; the quality of adaptation deteriorates under physical and nervous strain, sickness, and particularly alcoholic intoxication. T.M.

**A70-40291 #** Influence of increased pressure on the control habits (Deistvie povyshennogo davleniia na navyki upravleniia). V. I. Zorile and A. A. Kupriianov. *Voenna-Meditsinskii Zhurnal*, June 1970, p. 48-52. 5 refs. In Russian.

Study of the effects of increased oxygen pressure (200 to 350 mm water) and pressure fluctuation (25 to 100 mm water in phase with the respiratory cycle) on control training involving one-dimensional tracking to the stage of acquiring stable reactions. The task was to control the motion of a point on a screen in such a way as to follow a target point which moved according to a regular program. Analysis of the results shows that respiration at high pressure without external compensation reduces the quality of tracking control. Large pressure fluctuations have more pronounced deleterious effects than smaller fluctuations. The harmful effects arise from disturbance of the predictive functions and coordination. Changes in the bioelectrical activity of muscles during breathing at elevated pressure are analyzed. T.M.

**A70-40292 #** Influence of air noise on the human cardiovascular system (Vliianie vozdušnogo shuma na serdechno-sosudistuiu sistemu cheloveka). I. A. Sapov and N. F. Smorodin. *Voenna-Meditsinskii Zhurnal*, June 1970, p. 53, 54. In Russian.

Experimental study of functional changes in the cardiovascular system of ship's engineers during 4 and 12 hr exposures to taped high-frequency noise from an internal combustion engine. EKG recordings and arterial pressure measurements were analyzed. Four-hour exposures to 110 dB noise levels caused increased pulse frequencies, shortened durations of the cardiac cycle, and shortened electrical systole of the heart ventricles. Twelve-hour exposures resulted in more significant changes of these values and higher arterial pressure. Recovery after various rest periods is analyzed, and attention is given to changes in the EKG patterns. The data show that noise effects cause excitation of sympathetic innervation centers, particularly affecting the vasomotor center which results in increased arterial pressure. T.M.

**A70-40326 #** Circulatory impairment during exposure to ambient pressures of 4 mm Hg and 55 mm Hg. Alfred J. Pratt, Hubert L. Stone, Hugh F. Stegall, and William C. Kaufman (USAF, Aeromedical Research Laboratory, Holloman AFB, N. Mex.; USAF, School of Aerospace Medicine, Brooks AFB, Tex.). *Journal of Applied Physiology*, vol. 29, Aug. 1970, p. 177-180. 16 refs.

The extent that the circulation is impaired under near-vacuum conditions was investigated in five anesthetized dogs and one anesthetized chimpanzee decompressed from 380 mm Hg to 4 mm Hg in 1-2 s and maintained at 4 mm Hg for 60 s. Blood flow velocity, measured within the thoracic aorta with a catheter-tip Doppler flowmeter, severely decreased in dogs within 30 s and approximated cessation in the chimpanzee after 10 s. Aortic and vena caval pressures tended to equalize in dogs; equilibrium and subsequent pressure gradient inversion resulted in the chimpanzee. Mechanical events associated with gas expansion and especially water vaporiza-

tion were believed largely responsible for these effects. Anoxic bradycardia, similar in both species, ensued also. Anoxic anoxia, uncomplicated by water vaporization after decompression from 431 mm Hg to 55 mm Hg, failed to seriously impair cardiovascular function in dogs, but apparently was accompanied in the chimpanzee by mechanical events from gas expansion sufficient to block the circulation. Differences in responses in these two species probably involved the physical characteristics of the torso. (Author)

**A70-40327 Human peripheral rewarming during exercise in the cold.** B. Hellström, K. Berg, and F. Vogt Lorentzen (Institute of Aviation Medicine; Institutes of Occupational Research, Oslo, Norway). *Journal of Applied Physiology*, vol. 29, Aug. 1970, p. 191-199. 69 refs.

Experimental study in which five healthy young naked men with widely different maximum oxygen minute volumes rested for 20 min and exercised for 60 min at various intensities on a bicycle ergometer at 0 and 10 C ambient temperature. One hand was covered by a mitten. Skin, rectal, and tympanic membrane temperatures, as well as oxygen uptake, were measured. At work intensities corresponding to about 40 to 65% of the aerobic power all subjects obtained a marked, sustained rewarming of the fingers in the 0 C environment. This thermoregulatory rewarming was usually followed by rewarming of the dorsum of the hand, was significantly delayed in the coldest (unprotected) fingers, and was possibly controlled by both skin and core thermosensory information. The toes did not rewarm as readily as the fingers. Marked interindividual differences in finger rewarming and core temperature during exercise were not related to individual differences in maximum oxygen minute volumes. (Author)

**A70-40328 Estimation of heart stroke volume from blood hemoglobin and heart rate at submaximal exercise.** Rodolfo Margaria, Paolo Cerretelli, and Arsenio Veicsteinas (Milano, Università, Milan, Italy). *Journal of Applied Physiology*, vol. 29, Aug. 1970, p. 204-207. 10 refs. Research supported by the Consiglio Nazionale delle Ricerche.

Comparison of calculated and experimentally obtained heart stroke volume data. When the maximal aerobic power and hemoglobin content of the blood are known, the stroke volume of the heart at exercise can be calculated with sufficient approximation on the following assumptions: (1) that the oxygen saturation of arterial blood is independent of the work load, its value being 0.95 even in maximal exercise; (2) that the oxygen partial pressure of the mixed venous blood is a limiting factor in maximal exercise reaching a definite minimal constant value, corresponding to a 0.30 saturation of blood with oxygen, this leading to an arteriovenous difference in saturation of 0.65; and (3) that the maximal heart rate is constant at a given value, independent of the working capacity of the subject. The stroke volume as calculated is found to be the same as that directly determined in the same individual by a bloodless rebreathing method. M.V.E.

**A70-40329 Dynamics of ventilation and heart rate in response to sinusoidal work load in man.** O. Wigertz (Kungl. Karolinska Institutet, Stockholm, Sweden). *Journal of Applied Physiology*, vol. 29, Aug. 1970, p. 208-218. 29 refs. Research supported by the Swedish Medical Research Council.

Investigation of the dynamic characteristics of the responses of ventilation and heart rate to supine leg exercise with time-averaging harmonic analysis in 11 male athletes employing a sinusoidally varying work load with an average level of 650 kpm/min (106 W) and an amplitude of 400 kpm/min (65 W) at seven different frequencies with periods ranging from 15.0 to 0.75 min. For the ensemble-mean frequency responses, mathematical parameter identification yielded transfer functions which were first-order for ventilation with an

estimated time constant of 70 plus or minus 6 sec, and second-order for heart rate with time constants of 21 plus or minus 2 and 147 plus or minus 21 sec, the faster component accounting for 63% of the total response. Pure time delays were negligible for both variables. Readjustments in ventilation thus always lagged behind those in heart rate with a maximum time displacement of about 25 sec. It is concluded that, under the conditions studied, the controls of ventilation and cardiac output were dissociated and, furthermore, unaffected by any existing, fast (abrupt) components of cerebral or peripheral mechanoreceptive origin, or both. (Author)

**A70-40330 Mechanisms of cerebral vasodilatation in hypoxia.** Kyuya Kogure, Peritz Scheinberg, O. M. Reinmuth, Masatoshi Fujishima, and Raul Busto (Miami, University, Miami, Fla.). *Journal of Applied Physiology*, vol. 29, Aug. 1970, p. 223-229. 35 refs. Research supported by the Meyer Gold Grant; PHS Grant No. NB-05820.

Study of the effects of various degrees of hypoxia on cerebral blood flow in anesthetized dogs by methods which do not require a prolonged steady state. The findings include the following: (1) cerebral vascular response to hypoxia is a threshold phenomenon which correlates with the development of cerebral cortical acidosis; (2) cortical blood flow and the H(+) concentration increases simultaneously, suggesting the dependency of cerebral cortical blood flow on cortical pH; (3) circulating hypoxic products do not affect cerebral blood flow, indicating that the effects of hypoxia on cerebral blood flow are secondary to local parenchymatous changes in the brain; and (4) the cerebral vasodilatory response to hypoxia was lost in insulin-induced hypoglycemia, whereas vascular responsiveness persisted, indicating that hypoxic effects on cerebral circulation are dependent on anaerobic glycolysis and excess parenchymal lactate formation. M.V.E.

**A70-40331 Contribution of pulmonary stores to oxygen uptake.** J. Howland Auchincloss, Jr., Robert Gilbert, and Gerhard H. Baule (New York, State University; Syracuse University, Syracuse, N.Y.). *Journal of Applied Physiology*, vol. 29, Aug. 1970, p. 230-235. 6 refs. PHS Grant No. H-2800.

Study of ventilation variability at the onset of exercise, and development of methods for measuring oxygen uptake at the alveolar-capillary membrane ( $\dot{V}O_2$ ). The observation that alveolar oxygen concentration falls in normal subjects after the onset of exercise can be regarded as a depletion of gaseous pulmonary oxygen stores and therefore as a contribution of these stores to  $\dot{V}O_2$ . The possibility then arises that in some subjects a brisk rise in ventilation might abolish this depletion of stores or even cause an increment in stores during the unsteady state. The study suggests that this variability of response does exist in normal and cardiac subjects. However, since ventilation is under voluntary control, a demonstration of its variability at the onset of exercise has limited significance. More important is the development of methods for measurement of  $\dot{V}O_2$  which provide corrections for these changes in oxygen stores with maximum accuracy and simplicity. Certain equations and methods, which originally appeared essential for a true breath-to-breath display of  $\dot{V}O_2$ , were found to be amenable to simplification if interest was focused on a time period involving more than four breaths. The ways in which the measurement of  $\dot{V}O_2$  in the unsteady state differs from that in the steady state are pointed out, and a simpler equation is proposed for estimating  $\dot{V}O_2$  where periods longer than 4 breaths are of primary interest, as is the case in tests lasting 1 to 4 min for normal and cardiac subjects. M.V.E.

**A70-40332 Renal hemodynamic response of unanesthetized dogs to positive acceleration.** John E. Chimoskey (U.S. Naval Material Command, Naval Air Development Center,



Warminster; Hahnemann Medical College, Philadelphia, Pa.). *Journal of Applied Physiology*, vol. 29, Aug. 1970, p. 244-248. 27 refs.

Study of the renal hemodynamic response to positive accelerations within the range of physiological tolerance. Trained, unanesthetized dogs were exposed to positive centrifugal accelerations up to +6 Gz. Renal arterial pressure and inferior vena cava pressure at kidney level were measured through indwelling catheters. Renal blood flow velocity was measured by a Doppler-principle ultrasonic flowmeter and was found to decrease in proportion to +Gz. Mean renal arterial pressure rose at all G levels to 160-170 mm Hg. The pressure gradient was stable up to +3 Gz and then decreased. Intrarenal phenoxybenzamine, which did not alter preacceleration renal arterial pressure and blood flow velocity, partially inhibited the flow velocity reduction during +Gz. Intrarenal vasoconstriction mediated by alpha-adrenergic receptors is a part of the response to +Gz. M.V.E.

**A70-40333 \*** Total body water of the pig-tailed monkey, *Macaca nemestrina*. A. M. Kodama (California, University, Berkeley, Calif.). *Journal of Applied Physiology*, vol. 29, Aug. 1970, p. 260-262. 16 refs. Grant No. NGL-05-003-024; Contract No. NAS 2-4231.

Measurement of total body water in ten male pig-tailed monkeys (*Macaca nemestrina*) by the dilution technique using tritiated water. The tracer substance was injected and blood samples obtained by means of chronically implanted vascular catheters. The mixing of tritiated water in the animal was complete in 90 min, and the biological half-life was approximately 6 days. The biodecay curve of the injected dose of tritiated water was used to obtain a distribution concentration of the tracer material, free of the usual sources of error, for the calculation of its dilution volume. The mean body water content was found to be 65.5% of body weight. When total body water was computed in the usual way - i.e., from the concentration of tritiated water after mixing - the values obtained were 3 to 6% greater, presumably due to the exchange of tritium with tissue hydrogen. The mean per cent body fat computed from the relationship, % fat =  $100 - (\% \text{ total body water}/0.732)$ , was 10.5%, and the mean lean body mass was estimated to be 89.5% of body weight. (Author)

**A70-40448** The behavior of liver blood flow during an increase in liver oxygen consumption (Das Verhalten der Durchblutung der Leber bei Steigerung des Sauerstoffverbrauches der Leber). J. Scholtholt (Düsseldorf, Universität, Düsseldorf, West Germany). *Pflügers Archiv*, vol. 318, no. 3, 1970, p. 202-216. 40 refs. In German. Research supported by the Deutsche Forschungsgemeinschaft.

Investigation of the reaction of liver blood flow to an increased liver oxygen consumption achieved by an infusion of amino acids into the portal vein. An experiment is described in which the blood flow through both liver vessels was measured in anesthetized dogs with electromagnetic flowmeters. It is shown that the amount of blood, contributed to the total liver blood flow by the hepatic artery, is definitely determined by the amount of oxygen used by the liver. During the infusion, the arterial blood flow increases by 87%, while the arterial portion on total liver oxygen consumption increases by 77%. There is a close relationship between the arterial portion on total liver oxygen consumption and the amount of blood flowing through the hepatic artery. The arterial portion on total liver blood flow varies independently from the amount of blood contributed by the portal vein. The amount of oxygen, extracted by the liver from the blood flowing through the portal vein, can be increased by an increase in the oxygen difference between the portal vein and the hepatic veins. During the infusion the portal blood flow increases by 16%, and the portal portion on total liver oxygen consumption increases by 28%. The arterial portion on total liver oxygen consumption increases absolutely and relatively more. O.H.

**A70-40449 #** In vivo determination of the content of the nuclides K40, Th232, Cs137, Ra226, and Co60 in the human body by means of a whole-body counter (In-vivo-Bestimmung des Gehalts an den Nukliden K40, Th232, Cs137, Ra226 und Co60 im Körper des Menschen mit einem Ganzkörperzähler). R. I. Gabunia and M. G. Sereda (Akademii Meditsinskikh Nauk SSSR, Moscow, USSR). *Radiobiologia - Radiotherapia*, vol. 10, no. 6, 1969, p. 755-762. 9 refs. In German. (Translation).

Discussion of the quantitative analytical determination of nuclides which are normally contained in the human organism or may be introduced into it by occupational contamination giving particular attention to the evaluation of the gamma-ray spectra obtained. The principles of operation of the method used are discussed. A matrix approach for the evaluation of the data is considered. It is shown that the direct method of solution involving multiplication by the reciprocal matrix is not sufficiently accurate. Systematic errors arise because of instabilities of analyzer channels. A program is discussed for a mathematical calibration of the spectra. Statistical errors are reduced by considering only those nuclides whose content is statistically significant. The use of this program makes it possible to increase the accuracy of the calculation of the isotope content by nearly the factor 2. G.R.

**A70-40538 #** Measurement arrangement for the investigation of the ability of direction finding (Messeinrichtung zur Untersuchung des Richtungslokalisationsvermögens). B.-G. Hausteil and W. Schirmer (Dresden, Technische Universität, Dresden, East Germany). *Hochfrequenztechnik und Elektroakustik*, vol. 79, June 1970, p. 96-101. 13 refs. In German.

Discussion of the experimental arrangement used for diagnostic investigations of the sense of hearing regarding the perception of direction. The generation and the processing of white noise for the test is discussed, and the equipment for indicating the angle with respect to a mobile loudspeaker is described. Some details of the conduction of the test and of the statistical evaluation of the test results are given. G.R.

**A70-40541** Altered myocardial electrolyte content of high-altitude exposed rats. James J. McGrath (Rutgers University, New Brunswick, N.J.) and Robert W. Bullard (Indiana University, Bloomington, Ind.). *American Journal of Physiology*, vol. 219, Aug. 1970, p. 374-377. 14 refs. Contract No. AF 44(620)-68-C-0014.

Investigation of tissue level acclimation to chronic hypoxia by using the isolated right ventricular strip preparation and determining sodium and potassium contents before and after a bout of acute anoxia. Rats were exposed to an altitude of 22,500 ft in a barometric chamber for 15 days. The right ventricles were removed and divided into two portions. One portion was immediately analyzed for sodium and potassium, whereas the second was immersed in a buffered Ringer solution, aerated with 95% O<sub>2</sub>/5% CO<sub>2</sub> and stimulated electrically. Anoxic stress was applied by switching the aerating gas mixture to 95% N<sub>2</sub>/5% CO<sub>2</sub> for 6 min, after which stimulation was stopped, and the tissue sodium and potassium determinations were made. The ventricular strips of the altitude-exposed animals were found to contain a higher Na content, a higher combined Na + K content, and a lower K/Na ratio than the control strips. During anoxia, the greatest change was the increased uptake of sodium in the control strips, and this uptake was correlated with the poorer functional performance of the tissue under anoxic conditions. (Author)

**A70-40542** Fasting glucose homeostasis in rats after chronic exposure to hypoxia. Mayer B. Davidson and Vincent S. Aoki (U.S. Army, Biochemistry and Pharmacology Laboratory,



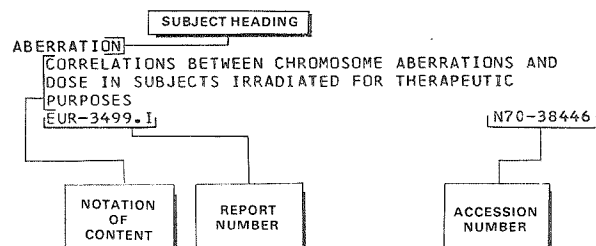
Natick, Mass.). *American Journal of Physiology*, vol. 219, Aug. 1970, p. 378-383. 36 refs.

Examination of factors contributing to the fasting concentration of plasma glucose in 24-hr fasted rats housed at a simulated altitude of 14,500 ft for 6 weeks and weight-matched sea level controls. The usual decrease in fasting glucose concentrations after chronic exposure to hypoxia was confirmed. No significant differences were observed in glucose spaces or fasting levels of plasma insulin, amino acids, and lactates. Hepatic glycogen was diminished, while new glucose formation from lactate and glutamine was increased in liver slices from hypoxic rats. There was no difference in gluconeogenesis from glycerol, in the hepatic levels of the gluconeogenic enzymes pyruvate carboxylase and phosphoenolpyruvate carboxykinase, in hepatic glycogen synthesis after glucose infusion, in glycogen synthesis by incubated diaphragms, or in glucose conversion to CO<sub>2</sub> by erythrocytes. Lactate production by the RBC of the hypoxic animals was decreased. It is suggested that after chronic exposure to hypoxia, the decreased hepatic glycogen contribution to fasting glucose homeostasis is not fully offset by the increase in gluconeogenesis, and consequently a lowered glucose concentration results. (Author)

# Subject Index

AEROSPACE MEDICINE AND BIOLOGY / a continuing bibliography NOVEMBER 1970

## Typical Subject Index Listing



The Notation of Content (NOC), rather than the title of the document, is used to provide a more exact description of the subject matter. The NASA or AIAA accession number is included in each entry to assist the user in locating the abstract in the abstract section of this supplement. If applicable, a report number is also included as an aid in identifying the document.

## A

### ABIOGENESIS

Cells chemical origin, discussing terrestrial fractionation, amino acids, macromolecules, metabolism, etc

A70-38992

Abiogenesis and effect of ultraviolet radiation on one-celled organisms

N70-37502

### ACCELERATION STRESSES (PHYSIOLOGY)

Soviet book on peripheral vestibular apparatus and higher nervous system roles in motion sickness covering Coriolis acceleration tests, pilot training and selection, drugs, etc

A70-37406

Frank orthogonal vectorcardiograms on humans during acceleration, using beat-by-beat real time analog-digital computer technique

A70-39435

Human gluco-regulatory hormone reserve depressions following acute and chronic acceleration exposure

A70-39436

Antimotion sickness drugs evaluated for effectiveness under standardized stress conditions in slow rotation room

A70-39439

Prolonged transverse acceleration effects on rats kidney and posterior hypophysis neurosecretions

A70-40188

Lung alveolar and capillary wall structure in mammals under normal conditions, transverse acceleration and mechanically changed pulmonary circulation

A70-40190

### ACCELERATION TOLERANCE

Hypokinesia and reduced diet effects on human tolerance to static loads, discussing acceleration tolerance prediction

A70-40198

Renal hemodynamic response of unanesthetized dogs to positive accelerations within physiological tolerance range, measuring pressure and blood flow velocity

A70-40332

Mineral and water metabolism in humans after exposure to transverse acceleration

N70-35002

Renal hemodynamic response of unanesthetized dogs to negative acceleration

N70-36301

### ACCIDENT PREVENTION

Industrial safety hazards of group and individual inorganic acids with control and preventive measures

N70-36635

Fundamentals of accident prevention

N70-37216

### ACIDOSIS

Hypoxia effects on cerebral blood flow in anesthetized dogs, considering acidosis and vasodilation

A70-40330

### ACTIVITY (BIOLOGY)

Human brain LF activity in visual evoked response, determining relationship to stimulation

A70-37846

### ACTIVITY CYCLES (BIOLOGY)

Circadian and seasonal adaptive function rhythms in animals, discussing terrestrial environment and thermoregulation

A70-38409

### ADAPTATION

Circadian and seasonal adaptive function rhythms in animals, discussing terrestrial environment and thermoregulation

A70-38409

State-of-the-art review on habituation processes and vestibular adaptation

N70-34989

Hepatic subcellular effects of altered atmospheres

N70-36211

### ADRENOCORTICOTROPIN (ACTH)

Ionizing radiation effects on endocrine system, studying ACTH metabolism in rats under X ray irradiation

A70-38723

### AEROBIOLOGY

Bacteriological research in high atmospheric layers for microorganisms

N70-36232

### AEROSOLS

Dispersion pattern of aerosol particles in free atmosphere

N70-35421

### AEROSPACE ENGINEERING

Applications of decision making, probability theory, and multi-level inference systems to aerospace information processing

N70-37468

### AEROSPACE MEDICINE

Medicobiological approach to living conditions for sustained residence and human activity during prolonged space flights, describing sealed chamber experiment

A70-37525

Medical support for long space missions based on space crews morbidity prediction, discussing onboard equipment and astronaut training

A70-40194

Astronauts medical examination, using thermal load as functional and diagnostic test

A70-40195

Transactions on aerospace biology and medicine

N70-34986

Physiological measurements and onboard computer processing for biotelemetric control of manned space flight

N70-35982

Aerospace medicine development in Russia

N70-37005

### AGE FACTOR

Radioactive contamination of human body bone marrow by strontium 90 as function of age and radiation dosage times

N70-36993

## AGING (BIOLOGY)

## SUBJECT INDEX

- Age factor and human tolerance to radioactive contamination of diets in different European regions by strontium 90 and cesium 137 [CEA-R-3861] N70-37074
- AGING (BIOLOGY)  
Senescent *Drosophila melanogaster* flight muscle electron microscopic examination showing mitochondria in stages of degeneration A70-40075
- AIR  
Effect of cabin pressure on environmental control system [NASA-TM-X-65009] N70-35804
- AIR FLOW  
Diaphragmatic muscle reactions and pneumogram changes in rats immediately after air passage obstruction A70-37804
- AIR POLLUTION  
Transport ratio for I-131 air to milk concentrations, determining mean value and statistical variation from Project Rover data A70-38012  
Hearing on air pollution in St. Louis area N70-35518  
Congressional hearings on establishing air quality criteria with respect to health and safety practices N70-35632  
Cost estimates for air pollution control during fiscal years 1970 to 1974 [S-DOC-91-40] N70-36024  
Progress in air pollution control [S-DOC-91-11] N70-36025  
Congressional hearings on air pollution control research in motor vehicle, aircraft, and diesel exhausts, and industrial and federal facilities wastes N70-36154  
Air pollution threat in Sacramento, California, projected population, vehicles, and activities [PB-191382] N70-37433  
Radiological physics report, including studies on radioactive toxicity, air pollution, Ce-137 fallout, and dosimetry [ANL-7615] N70-37435  
Air quality control standards for New Jersey, New York, and Connecticut [PB-191389] N70-37519
- AIR TRAFFIC CONTROL  
Air traffic controller stress reduction, discussing work-rest intervals and various management and human factors A70-38647  
Human factors in ATC, discussing simulation trials and impending problems A70-38648  
Air traffic controller role in future air traffic system, considering automation in operations A70-38649  
ATC personnel training at International ATC Academy, discussing objectives and syllabus A70-38650
- AIR TRANSPORTATION  
Air transportation of respiratory failure patients, considering medical equipment adaptation for aircraft use A70-39440
- AIRBORNE/SPACEBORNE COMPUTERS  
Physiological measurements and onboard computer processing for biotelemetric control of manned space flight [JPRS-50977] N70-35982
- AIRCRAFT CARRIERS  
Research in visual perception for carrier landing [AD-706036] N70-36480
- AIRCRAFT COMPARTMENTS  
Hypoxia warning systems using polarographic sensor and miniaturized electronics for face-mask and cabin installation for aircraft and spacecraft A70-39429
- AIRCRAFT CONTROL  
Soviet book on man in aircraft control system covering engineering psychology, complex flight problems, human factors and instrument panels A70-37236
- AIRCRAFT LANDING  
TV display simulation of instrument and visual aircraft landing approaches, investigating color, collimation and resolution effects on pilot evaluations A70-39172  
Research in visual perception for carrier landing [AD-706036] N70-36480
- AIRCRAFT MAINTENANCE  
Industrial safety harness assessment for aircraft serving personnel [FPRC/MEHO-246] N70-36510
- AIRCRAFT NOISE  
Temporal and spectra combination effects on aircraft sound judged noisiness, using human subjects in anechoic chamber A70-39712
- AIRFRAME MATERIALS  
Consequences of tinting in aircraft windshields [AM-MEMO-26] N70-37511
- AIRLINE OPERATIONS  
Geographic orientation in air operations for military aircraft systems [AD-705021] N70-36457
- AIRLOCK MODULES  
Simulation test data for storage box transfer through airlock module [NASA-TM-X-53887] N70-35915
- ALANINE  
Free radicals/radiation dosage linear relationship in alanine using electron paramagnetic resonance for biological tissue radiation damage study [CEA-R-3913] N70-36998
- ALCOHOLS  
Alcohol sporulation evaluation for contamination control in stainless steels [NASA-TM-X-53891] N70-37585
- ALDOSTERONE  
Aldosterone effect on hemodynamics of dogs under restricted movement in cages N70-34996
- ALERTNESS  
Human vigilance paradigm and physiology, discussing relationships between vigilance, signal detection and animal discrimination A70-38324
- ALGAE  
Anomalous substrate oxidizing specificities among red brown and green algal peroxidases and land plants A70-37773  
Unicellular hot spring acidophilic alga *Cyanidium* cadarium cultured in pure carbon dioxide, examining packed cell volume, oxygen production and growth rate A70-39492  
Hydrostatic pressure effects on photosynthesis and growth of unicellular marine algae and diatoms [AD-704496] N70-36546
- ALGORITHMS  
Physiological measurements and algorithms for data processing in biological telemetry N70-35984
- ALLOCATIONS  
Optimum attention allocation, discussing distraction resistance and multiple task performance A70-38316
- ALTITUDE ACCLIMATIZATION  
Myocardial contractile function in rats under acute overstrain, evaluating role of preliminary training to altitude hypoxia A70-37805  
Hemodynamic changes in Andean native after two years at sea level, measuring intravascular pressures, cardiac output, heart rate and stroke index A70-39427
- ALTITUDE SICKNESS  
Acute mountain sickness symptomatology and cognitive performance, using standardized General High Altitude Questionnaire A70-40025
- ALTITUDE SIMULATION  
Mice immunobiological reactivity at simulated high altitude A70-40189
- ALTITUDE TOLERANCE  
Hypoxia and high ambient temperature effects on altitude tolerance in animals A70-40186

## SUBJECT INDEX

## ATMOSPHERIC COMPOSITION

- ALVEOLAR AIR**  
Exhaled alveolar air data acquisition using mass spectrometer and multichannel analyzer  
A70-37356
- ALVEOLI**  
Lung alveolar and capillary wall structure in mammals under normal conditions, transverse acceleration and mechanically changed pulmonary circulation  
A70-40190  
Oxygen uptake at alveolar capillary membrane, investigating ventilation variability at exercise onset  
A70-40331
- AMINO ACIDS**  
Tyrosine content and utilization in mouse liver, showing daily rhythm in composite metabolism rate  
A70-38976  
Protein biosynthesis of various forms of soluble ribonucleic acids and aminoacyl RNA synthetases [NASA-TT-F-13186]  
N70-37531
- AMMONIA**  
Ca ion reversible effects of hydrochloric acid and ammonia water on betacyanin leakage from beetroot sections  
A70-38375
- ANAEROBES**  
Endogenous metabolism and survival of non-spore forming anaerobic bacteria under starving conditions  
[AD-703930]  
N70-36272
- ANALOG COMPUTERS**  
Analog computer for continuous recording of oxygen consumption of muscular area in canine foot via blood flow rate and oxygen saturation  
A70-37354
- ANALOG DATA**  
Real time analog display inputs for electronic computers and tracking in physiological control circuits, describing various manual controls  
A70-37564
- ANATOMY**  
Weight, volume, and center of mass of segments of human body  
[NASA-CR-112672]  
N70-36813
- ANECHOIC CHAMBERS**  
Temporal and spectra combination effects on aircraft sound judged noisiness, using human subjects in anechoic chamber  
A70-39712
- ANESTHETICS**  
Renal hemodynamic response of unanesthetized dogs to negative acceleration  
[AD-702745]  
N70-36301
- ANGULAR ACCELERATION**  
Measurement of head angular acceleration during impact  
[AD-704704]  
N70-36249
- ANIMALS**  
Automatic control systems using small animals  
[AD-703085]  
N70-35636
- ANTHROPOMETRY**  
Anthropometric determinations of American born Macaca mulatta for orbiting primate experiment  
[AD-700907]  
N70-36495  
Weight, volume, and center of mass of segments of human body  
[NASA-CR-112672]  
N70-36813
- ANTIGENS**  
Antigens immunological response during myocardial infarction  
A70-39151
- ANTIRADIATION DRUGS**  
Prolonged space flight simulation and irradiation effects on dogs treated with ATP and amytravir drugs  
N70-34990
- APOLLO FLIGHTS**  
Portable contingency transfer life support system for crewman of Apollo missions providing oxygen and cooling  
A70-39441
- APOLLO PROJECT**  
Crew training program for third manned Apollo mission  
[NASA-TM-X-65047]  
N70-35788  
Mission training program for Apollo Lunar Landing Mission
- [NASA-TM-X-65078]  
N70-35826
- APOLLO SPACECRAFT**  
Performance of Apollo sea dye marking powder  
[NASA-TM-X-65045]  
N70-35724  
Breathing mask for Apollo command module spacecrew  
[NASA-TM-X-64441]  
N70-35728  
Water management during flight of Apollo spacecraft  
[NASA-TM-X-64445]  
N70-35803  
Effect of cabin pressure on environmental control system  
[NASA-TM-X-65009]  
N70-35804
- APTITUDE**  
Aptitude test validity taking into account selection board subjective decisions on pilot applicant acceptance  
A70-38507
- ARM (ANATOMY)**  
Rejection of arm prosthetic devices by children with congenital deformities  
[PR-1103-70]  
N70-37224
- AROUSAL**  
Noise effects on arousal level in auditory vigilance from EEG parameters  
A70-38325
- ARTERIES**  
Arterial pressure measurement by automatic control system based on external compression pressure for maximum amplitude intraarterial pressure pulse oscillations  
A70-38215  
Human body elastic properties effects on arterial pressure measurement by sphygmomanometer  
A70-39879  
Human arterial hypertension, correlating ECG changes with systemic hemodynamics  
A70-40069
- ARTIFICIAL INTELLIGENCE**  
Linguistic competence of languages and performance grammars in machine conversation  
[P-4391]  
N70-36107
- ASPHYXIA**  
Extracellular spontaneous sequences of action potentials of thalamic neurons during asphyxia in rats under artificial respiration  
A70-38306
- ASTRONAUT LOCOMOTION**  
Simulation test report for multiple docking adapter external handrail system evaluation  
[NASA-TM-X-53894]  
N70-37533  
Methods and procedures for evaluating internal mobility aids in multiple docking adapters  
[NASA-TM-X-53895]  
N70-37583
- ASTRONAUT PERFORMANCE**  
Astronauts medical examination, using thermal load as functional and diagnostic test  
A70-40195  
Physiological responses of Soyuz 6, 7, and 8 astronauts  
N70-34999
- ASTRONAUT TRAINING**  
Medical support for long space missions based on space crews morbidity prediction, discussing onboard equipment and astronaut training  
A70-40194  
Water immersion for weightlessness simulation in astronaut training  
[NASA-TM-X-64428]  
N70-35749  
Crew training program for third manned Apollo mission  
[NASA-TM-X-65047]  
N70-35788  
Mission training program for Apollo Lunar Landing Mission  
[NASA-TM-X-65078]  
N70-35826
- ASTRONAUTS**  
Astronaut weight loss relation to flight duration during manned space missions  
A70-40125  
Literature search with abstracts on visual performance standards for selection and retention of astronauts  
[NASA-CR-108587]  
N70-36362
- ATHLETES**  
Athletes ventilation and heart rate dynamic responses to supine leg exercise with sinusoidal work load  
A70-40329
- ATMOSPHERIC COMPOSITION**  
Atmospheric composition cyclic changes effects on

## ATMOSPHERIC PRESSURE

- human basal metabolism under hypokinesia  
A70-40197
- ATMOSPHERIC PRESSURE**  
Sinusoidal vibrations effects on rats at different air pressures, discussing human vibration tolerances and resonant frequencies of thoraco-abdominal system  
A70-39434
- Reduced atmospheric pressure effect on human elimination of gaseous and volatile metabolites in pressurized suits  
N70-35001
- ATTENTION**  
Visual attention and temporal cortex stimulation effects on evoked electrical activity in monkey brain  
A70-37812
- Attention and performance - Conference, Soesterberg, Netherlands, August 1969  
A70-38310
- Reaction time intersensory facilitation relationship to single channel theories of attention and human performance  
A70-38312
- Attention theory experimental design logic, discussing quantitative theory  
A70-38315
- Optimum attention allocation, discussing distraction resistance and multiple task performance  
A70-38316
- Attention direction role in auditory recognition, testing unwanted inputs attenuation hypothesis  
A70-38317
- Enhanced evoked potentials sited by auditory stimuli in complex task, considering EEG and neurophysiological basis of selective attention  
A70-38318
- Human memory information structure, discussing pattern recognition, simultaneous attention, problem solving and logic  
A70-38322
- Human vigilance paradigm and physiology, discussing relationships between vigilance, signal detection and animal discrimination  
A70-38324
- Noise effects on arousal level in auditory vigilance from EEG parameters  
A70-38325
- Physiological correlates of vigilance performance in humans  
[AD-706054]  
N70-34976
- ATTITUDE (INCLINATION)**  
Mechanisms controlling orientation of side roots and other plagiotropic plant parts in geotropic critical angle  
[NASA-TT-F-12639]  
N70-36014
- AUDITORY PERCEPTION**  
Attention direction role in auditory recognition, testing unwanted inputs attenuation hypothesis  
A70-38317
- Auditory direction finding ability, discussing experimental arrangement, white noise production, test conduction and statistical evaluation  
A70-40538
- Psychological effects of assigning unexpected tasks to operator in simulated space flight environment  
N70-35000
- Temporal sensory integration and auditory and tactile thresholds  
[AD-703376]  
N70-35366
- AUDITORY STIMULI**  
Human response time to visual stimulus preceding or following auditory stimulus as function of interstimulus interval  
A70-38311
- Enhanced evoked potentials sited by auditory stimuli in complex task, considering EEG and neurophysiological basis of selective attention  
A70-38318
- Noise effects on arousal level in auditory vigilance from EEG parameters  
A70-38325
- Rat neuron impulsive reactions and frequency response differences to varying sound signals, discussing time constant, signal intensity and frequencies

## SUBJECT INDEX

- AUTOCORRELATION**  
Ballistocardiogram autocorrelation function and spectrum by scanning graph decoder and computer, determining total power, harmonics periodicity and energy concentration  
A70-38211
- Cardiac contraction rhythm autocorrelation and spectral analysis in healthy subjects and patients with disturbed sinus node functional states  
A70-38963
- AUTOMATIC CONTROL**  
Soviet book on isolated animal heart autoregulation, considering cardio-pulmonary preparations, functional capacity, biometrics and computer technology for heart activity simulation models  
A70-37404
- Arterial pressure measurement by automatic control system based on external compression pressure for maximum amplitude intraarterial pressure pulse oscillations  
A70-38215
- Electroencephalography with automatic frequency analysis to simulate processes involving brain self regulation  
A70-38218
- Air traffic controller role in future air traffic system, considering automation in operations  
A70-38649
- Automatic control systems using small animals  
[AD-703085]  
N70-35636
- AXES (REFERENCE LINES)**  
Imaginary axes effect of phenomenal space in contrast illusions of distance, discussing division of S field of vision by definite point fixation  
A70-39764
- AZOLES**  
Effect of 3-methylisoxazole-5-carbonic acid on metabolism and thermoregulation of mice exposed to cold  
[NASA-TT-F-13158]  
N70-36110

## B

- BACTERIA**  
Enzyme system of respiratory chain and oxidizing phosphorolysis in bacteria  
[NASA-TT-F-13187]  
N70-37564
- BACTERIOLOGY**  
Bacteriological research in high atmospheric layers for microorganisms  
[AD-703889]  
N70-36232
- BACTERIOPHAGES**  
Lambda prophage induction into lysogens, noting nalidixic acid role in DNA synthesis inhibition  
A70-39774
- BALLISTOCARDIOGRAPHY**  
HF ballistocardiograms resonance distortions correction, using electrical selective filters  
A70-38210
- Ballistocardiogram autocorrelation function and spectrum by scanning graph decoder and computer, determining total power, harmonics periodicity and energy concentration  
A70-38211
- BAROTRAUMA**  
Hypobaric hypoxia effects on MM virus infection resistance in mice  
A70-39428
- BEARING (DIRECTION)**  
Auditory direction finding ability, discussing experimental arrangement, white noise production, test conduction and statistical evaluation  
A70-40538
- BEHAVIOR**  
Reflection of reality as mechanism controlling behavior of life  
[JPRS-51176]  
N70-37279
- BIBLIOGRAPHIES**  
Bibliography on reaction time in human information processing tasks  
[AD-703857]  
N70-35375
- Bibliography on small group dynamics - Vol. 1  
[AD-703600]  
N70-35482

- Human electric shock hazards - bibliographies  
[AD-705067] N70-36575
- Bibliography on natural environmental radioactivity  
[WASH-1061-SUPPL] N70-37128
- Bibliography of irradiated sugar and starch diet effects on mammals, microorganisms and insects  
[CEA-BIB-178] N70-37139
- Bibliography of literature on environmental contamination by mercury N70-37333
- BINOCULAR VISION**
- Panum phenomenon explained by projection, attraction and figure ground psychological theories A70-38505
- Lighting and background effects on human binocular color vision of signal lights in industry A70-38923
- BIOASSAY**
- Cleaning procedure effects on sterilization of spacecraft components  
[NASA-TM-X-53885] N70-37500
- BIOASTRONAUTICS**
- Medicobiological approach to living conditions for sustained residence and human activity during prolonged space flights, describing sealed chamber experiment A70-37525
- Transactions on aerospace biology and medicine  
[JPRS-50862] N70-34986
- BIOCHEMISTRY**
- Cells chemical origin, discussing terrestrial fractionation, amino acids, macromolecules, metabolism, etc A70-38992
- BIOCLIMATOLOGY**
- Human bioclimatology at high altitude, discussing energy balance in terms of net solar and terrestrial radiation balance in mountain area A70-37369
- BIOCONTROL SYSTEMS**
- Serum growth hormone response to hypoglycemia in man following insulin administration, reviewing lumped parameter model A70-38006
- BIODYNAMICS**
- Muscle function mechanics across knee joint in walking, relating tension to length, velocity and energy absorption A70-37810
- Physical characteristics of synthetic and nerve membranes  
[AD-698816] N70-36431
- Weight, volume, and center of mass of segments of human body  
[NASA-CR-112672] N70-36813
- BIOELECTRIC POTENTIAL**
- Visual attention and temporal cortex stimulation effects on evoked electrical activity in monkey brain A70-37812
- EEG analysis for poststimulus events, examining contingent negative variation and late positive wave of average evoked potential A70-37813
- Intracellular myocardium potentials under vagus inhibition by electrometric DC amplifiers with positive and negative feedback A70-38213
- Multipoint recording of bioelectric potentials based on electroencephalography, discussing multiple leadout, amplification, analysis, etc A70-38217
- Extracellular spontaneous sequences of action potentials of thalamic neurons during asphyxia in rats under artificial respiration A70-38306
- Enhanced evoked potentials sited by auditory stimuli in complex task, considering EEG and neurophysiological basis of selective attention A70-38318
- Pulse coding system for average evoked EEG potential data acquisition and analysis, describing pulse generation circuitry and computer implemented logic A70-38985
- BIOELECTRICITY**
- Human brain LF activity in visual evoked response, determining relationship to stimulation A70-37846
- BIOINSTRUMENTATION**
- Extradural sensor for continuous measurement and recording of human intracranial pressure in neurosurgical practice A70-37353
- Analog computer for continuous recording of oxygen consumption of muscular area in canine foot via blood flow rate and oxygen saturation A70-37354
- Exhaled alveolar air data acquisition using mass spectrometer and multichannel analyzer A70-37356
- Thermal thermesthesiometer for skin heat sensibility studies A70-37806
- Thermal electronic instrumentation applied to biological flows including blood flow, cardiac outputs and volumes A70-37843
- Uncoated quartz twin crystal microbalance for monitoring water vapor content of respiratory gases A70-37844
- Cardiac rhythm, respiration and rhythmical processes of alimentary tract, using digital data device A70-38214
- Arterial pressure measurement by automatic control system based on external compression pressure for maximum amplitude intraarterial pressure pulse oscillations A70-38215
- Electronic differentiator for physiological research, discussing electrical voltage derivatives reproduction, sensitivity, etc A70-38219
- Stabilograph and support dynamograph based on amplitude modulation of carrier frequency for standing stability determination in humans A70-38220
- Reliability tests of blood carbon dioxide pressure measurement methods, indicating carbon dioxide-electrode method superiority A70-38371
- Coulometric microrespirometer for long term numerical recording of oxygen consumption in respiratory chamber under sterile conditions A70-38372
- Electromagnetic blood flowmeters for circulatory research A70-39371
- Medical monitoring system onboard Soyuz spacecraft, describing equipment design, data acquisition and analysis, telemetric recordings, etc A70-40193
- BIOLOGICAL EFFECTS**
- Lighting effects on phenylethanolamine-N-methyl-transferase /PNMT/ activity and adrenal epinephrine content in rats A70-38982
- Toxicity problems from burning or heating of polymeric materials, discussing laboratory experiments and standardized toxicity testing procedures A70-39406
- Soviet book on dynamics of postradiation damage of biological objects covering dosage and protection effects on various animals A70-39824
- Mice immunobiological reactivity at simulated high altitude A70-40189
- Proton irradiation effects on dogs with partial body protection A70-40192
- Physiological monitoring system for interplanetary manned space flight N70-35985
- Bibliography of irradiated sugar and starch diet effects on mammals, microorganisms and insects  
[CEA-BIB-178] N70-37139
- BIOLOGICAL EVOLUTION**
- Reflection of reality as mechanism controlling behavior of life  
[JPRS-51176] N70-37279



## BIOLOGY

## SUBJECT INDEX

- Applying paleontological method of studying  
sedimentary deposits to investigation of  
earliest forms of life in northern Eurasia  
[NASA-TT-F-13189] N70-37473
- Evolution trends of carbohydrate metabolism in  
invertebrates  
[NASA-TT-F-13190] N70-37490
- Role of mediators in individual development and  
changes in their functions during evolution  
[NASA-TT-F-13191] N70-37559
- BIOLOGY**
- Biological field investigative techniques and  
practices of water pollution N70-36149
- BIOMEDICAL DATA**
- Nonlinear regression analysis of biomedical data  
by time-sharing computers  
[AD-704858] N70-36541
- BIOMETRICS**
- Soviet book on isolated animal heart  
autoregulation, considering cardio-pulmonary  
preparations, functional capacity, biometrics  
and computer technology for heart activity  
simulation models A70-37404
- Frank orthogonal vectorcardiograms on humans  
during acceleration, using beat-by-beat real  
time analog-digital computer technique A70-39435
- BIONICS**
- Alpha rhythm phase coherence during photic  
blocking, examining pacemaker model A70-37811
- Multipurpose microminiature multichannel  
biomedical telemetry system, discussing design  
A70-37856
- Electroencephalography with automatic frequency  
analysis to simulate processes involving brain  
self regulation A70-38218
- Axiomatic approach to homeostasis, discussing  
living systems as oscillators with input-output  
and transit variables in duration and elongation  
A70-38411
- Computer simulated decision hierarchical model of  
helicopter and VTOL pilot for multiloop closure  
and tracking characteristics of man-vehicle  
system A70-38921
- Mathematical model of human pituitary gland  
mechanism controlling secretions of serum growth  
hormone in response to glucose deficiency A70-38995
- Digital computer model of total body ECG surface  
maps, simulating male torso with lungs A70-39369
- BIOSATELLITE 2**
- Genetic effects of radiation dosage on Neurospora  
during Gemini 11 and biosatellite 2 missions  
[NASA-CR-112354] N70-36826
- BIOSYNTHESIS**
- Protein biosynthesis of various forms of soluble  
ribonucleic acids and aminoacyl RNA synthetases  
[NASA-TT-F-13186] N70-37531
- BIOTECHNOLOGY**
- Mechanical analysis involving clamping apparatus  
for cardiac muscle contractile response A70-39362
- BIOTELEMETRY**
- Multipurpose microminiature multichannel  
biomedical telemetry system, discussing design  
A70-37856
- Dynamic radio telemetry in physiology and  
medicine, discussing recordable parameters,  
multichannel systems, automatic data processing,  
etc A70-38216
- Cardiovascular stress testing using posterior  
bipolar lead for radiotelemetry monitoring  
A70-39199
- Radio telemetry measurements of blood pressure and  
flow in unrestrained animals A70-39370
- Electrolyteless ultrasonic Doppler biotelemetry  
cardiography system N70-35004
- Physiological measurements and onboard computer  
processing for biotelemetric control of manned  
space flight
- [JPRS-50977] N70-35982
- Design of automated physiological measuring and  
biotelemetry system for manned spaceship N70-35983
- Physiological measurements and algorithms for data  
processing in biological telemetry N70-35984
- Physiological monitoring system for interplanetary  
manned space flight N70-35985
- BLOCKING**
- Alpha rhythm phase coherence during photic  
blocking, examining pacemaker model A70-37811
- BLOOD**
- Reliability tests of blood carbon dioxide pressure  
measurement methods, indicating carbon  
dioxide-electrode method superiority A70-38371
- Heart stroke volume estimation at submaximal  
exercise using blood hemoglobin content and  
heart rate A70-40328
- BLOOD CIRCULATION**
- Peripheral vasculocapillary blood circulation by  
television UV capillaroscopy and electronic  
finger plethysmography A70-38212
- Cardiovascular blood circulation system dynamic  
characteristics analysis by linear statistical  
correlation methods, describing test for  
determining weighting function A70-39905
- Ambient near vacuum pressure effect on blood  
circulation, examining thoracic aorta blood  
flow, pressures, gas expansion and water  
vaporization A70-40326
- BLOOD FLOW**
- Analog computer for continuous recording of oxygen  
consumption of muscular area in canine foot via  
blood flow rate and oxygen saturation A70-37354
- Thermal electronic instrumentation applied to  
biological flows including blood flow, cardiac  
outputs and volumes A70-37843
- Circulating blood volume and heart minute and  
stroke volumes in rabbits, using isotope-labeled  
albumin A70-38724
- Visceral blood flow during exercise in sled dogs,  
testing hypothetical compensatory decrease as  
cardiovascular reserve for skeletal muscle by  
biotelemetry A70-39366
- Pulmonary hypertension in congenital heart  
diseases as function of blood flow A70-39367
- Radio telemetry measurements of blood pressure and  
flow in unrestrained animals A70-39370
- Electromagnetic blood flowmeters for circulatory  
research A70-39371
- Ambient near vacuum pressure effect on blood  
circulation, examining thoracic aorta blood  
flow, pressures, gas expansion and water  
vaporization A70-40326
- Hypoxia effects on cerebral blood flow in  
anesthetized dogs, considering acidosis and  
vasodilation A70-40330
- Liver blood flow in dogs during increased oxygen  
consumption A70-40448
- BLOOD PLASMA**
- Chloride ion shift of respiration occurring  
between plasma and erythrocytes as function of  
carbon dioxide, using rapid filtration method  
A70-38366
- Portable battery operated system for rapid  
measurements of blood plasma electrolytes during  
aeromedical evacuation A70-39433
- BLOOD PRESSURE**
- Arterial pressure measurement by automatic control  
system based on external compression pressure

## SUBJECT INDEX

## CAPILLARIES (ANATOMY)

- for maximum amplitude intraarterial pressure  
pulse oscillations A70-38215
- Dynamic intravascular pressures measured in small  
vessels of frog lung using micropressure  
transducer inserted into vessel lumen A70-38368
- Radio telemetry measurements of blood pressure and  
flow in unrestrained animals A70-39370
- Human body elastic properties effects on arterial  
pressure measurement by sphygmomanometer A70-39879
- Ambient near vacuum pressure effect on blood  
circulation, examining thoracic aorta blood  
flow, pressures, gas expansion and water  
vaporization A70-40326
- BLOOD VESSELS**
- Dynamic intravascular pressures measured in small  
vessels of frog lung using micropressure  
transducer inserted into vessel lumen A70-38368
- Blood vessels constriction in rear limbs, small  
intestine and spleen of dog with arterial blood  
heated above rectal temperature A70-40173
- Nonlinear analysis of pressure waves and shock  
waves in blood vessels  
[NASA-CR-112864] N70-36857
- Variations in mechanical properties of canine  
abdominal vena cava  
[NASA-CR-112876] N70-37029
- BODY COMPOSITION (BIOLOGY)**
- Macaca nemestrina total body water measurement by  
dilution technique A70-40333
- BODY FLUIDS**
- Macaca nemestrina total body water measurement by  
dilution technique A70-40333
- BODY MEASUREMENT (BIOLOGY)**
- Ulnar resonant frequency reproducibility as  
objective measure of skeletal status, discussing  
forearm and hand positioning effect A70-39432
- BODY SIZE (BIOLOGY)**
- Mathematical model of human pituitary gland  
mechanism controlling secretions of serum growth  
hormone in response to glucose deficiency A70-38995
- BODY TEMPERATURE**
- Psychotropic drugs radioprotective effects in mice,  
noting oxygen consumption and body temperature  
decrease after X ray exposure A70-37558
- Human body core temperature control dependence  
during exercise on heat dissipation, noting  
sweating control A70-38997
- Body surface cooling level and rate effects on  
psychomotor performance tested at various levels  
of mean weighted skin temperature /MWST/ A70-39675
- Human peripheral blood flow rewarming in cold  
ambient temperature, examining skin, rectal and  
tympanic membrane and oxygen uptake A70-40327
- BODY WEIGHT**
- Astronaut weight loss relation to flight duration  
during manned space missions A70-40125
- BONE MARROW**
- Simulated space flight radiation effects on dogs  
DNA synthesis and bone marrow cell  
differentiation A70-40191
- Radioactive contamination of human body bone  
marrow by strontium 90 as function of age and  
radiation dosage times  
[CEA-R-3952] N70-36993
- BONES**
- Morphological changes in bone and muscle tissue  
during hypokinesia N70-35005
- BOTANY**
- Mechanisms controlling orientation of side roots  
and other plagiotropic plant parts in geotropic  
critical angle
- [NASA-TT-F-12639] N70-36014
- BRAIN**
- Human brain LF activity in visual evoked response,  
determining relationship to stimulation A70-37846
- Electroencephalography with automatic frequency  
analysis to simulate processes involving brain  
self regulation A70-38218
- Acetylcholinesterase and simple esterases  
distribution in squirrel monkey brain, examining  
activity in neuropil and postrema area neurons A70-38993
- Radiation dosage of Tc 99 iron/II/ complex for  
brain tumors  
[LIB/TRANS-237] N70-37581
- BRAIN DAMAGE**
- Measurement of head angular acceleration during  
impact  
[AD-704704] N70-36249
- BREADBOARD MODELS**
- Manned testing of flight breadboard oxygen system  
[NASA-CR-73395] N70-36933
- BREATHING**
- Diaphragmatic muscle reactions and pneumogram  
changes in rats immediately after air passage  
obstruction A70-37804
- Human sensory perception associated with  
breathing, comparing physical stimulus intensity  
with judgement of magnitude A70-38370
- BREATHING APPARATUS**
- Breathing mask for Apollo command module spacecrew  
[NASA-TM-X-64441] N70-35728
- BRIGHTNESS DISCRIMINATION**
- Brightness contrast by human observer binocular  
matching, discussing neural networks models A70-38924
- BUBBLES**
- Erythrocyte suspension subjected to gas bubble  
ultrasonic oscillation, investigating hemolysis  
mechanism A70-39981
- C**
- CALCIFICATION**
- Macroscopic architectural changes of cancellous  
and cortical bone in Rhesus monkey following  
long term immobilization and chemical removal of  
calcium A70-38983
- CALCIUM**
- Ca ion reversible effects of hydrochloric acid and  
ammonia water on betacyanin leakage from  
beetroot sections A70-38375
- CALCIUM PHOSPHATES**
- Repair of dental enamel using calcium phosphate  
gel  
[NASA-CASE-ERC-10338] N70-36053
- CALIFORNIA**
- Air pollution threat in Sacramento, California,  
projected population, vehicles, and activities  
[PB-191382] N70-37433
- CALORIC STIMULI**
- Adjustable headholder for semicircular canal  
caloric testing  
[AD-700738] N70-36435
- CANCER**
- Proceedings from symposium on inhalation  
carcinogenesis  
[CONF-691001] N70-37428
- CANNING**
- Sterilization and storage effects on nutritional  
value of canned foods  
[R-3092] N70-35577
- CAPILLARIES (ANATOMY)**
- Peripheral vasculocapillary blood circulation by  
television UV capillaroscopy and electronic  
finger plethysmography A70-38212
- Lung alveolar and capillary wall structure in  
mammals under normal conditions, transverse  
acceleration and mechanically changed pulmonary  
circulation A70-40190

## CARBOHYDRATE METABOLISM

## SUBJECT INDEX

## CARBOHYDRATE METABOLISM

- Evolution trends of carbohydrate metabolism in invertebrates  
[NASA-TT-F-13190] N70-37490
- CARBON DIOXIDE**  
Chloride ion shift of respiration occurring between plasma and erythrocytes as function of carbon dioxide, using rapid filtration method A70-38366  
Reliability tests of blood carbon dioxide pressure measurement methods, indicating carbon dioxide-electrode method superiority A70-38371  
Unicellular hot spring acidophilic alga Cyanidium cadarium cultured in pure carbon dioxide, examining packed cell volume, oxygen production and growth rate A70-39492  
Inflation tests of liferafts with CO<sub>2</sub> and N<sub>2</sub> at low temperatures N70-35262
- CARBON DIOXIDE CONCENTRATION**  
Carbon dioxide content of dialyzed human hemoglobin measured at specific pressure and varying pH values as function of 2,3 diphosphoglycerate A70-38367
- CARBON DIOXIDE TENSION**  
Hyperbaric oxygen exposure produced hypertension and pulmonary edema, discussing carbon dioxide transport mechanism in blood A70-39430  
Carbon dioxide tension in arterial blood effects on rhythmic volley activity of respiratory neurons in medulla oblongata N70-34993
- CARCINOGENS**  
Proceedings from symposium on inhalation carcinogenesis [CONF-691001] N70-37428
- CARDIAC VENTRICLES**  
Cardiac ventricular function in compression pump terms, relating mechanical activity to end-diastolic fiber length A70-39364  
Determinants of human ventricular dimensions and myocardial free velocity relations during maximum and submaximum exercise levels A70-39365
- CARDIOVASCULAR SYSTEM**  
Hemodynamic effect of lidocaine given by infusion and bolus injections in myocardial infarction, examining cardiac output, heart rate, systolic left ventricular and aortic pressures A70-38575  
Cardiovascular stress testing using posterior bipolar lead for radiotelemetry monitoring A70-39199  
Visceral blood flow during exercise in sled dogs, testing hypothetical compensatory decrease as cardiovascular reserve for skeletal muscle by biotelemetry A70-39366  
Hemodynamic changes in Andean native after two years at sea level, measuring intravascular pressures, cardiac output, heart rate and stroke index A70-39427  
Cardiovascular blood circulation system dynamic characteristics analysis by linear statistical correlation methods, describing test for determining weighting function A70-39905  
Ship engineers cardiovascular system functional changes during HF internal combustion engine noise, investigating EKG recordings and arterial pressure A70-40292  
Nitrogen trifluoride effects on rat cardiovascular system [AD-705045] N70-36468
- CASE HISTORIES**  
Case history of search profiles and selective dissemination of information on intestine material absorption [OSTI-5027] N70-37047
- CATABOLISM**  
Enzyme system of respiratory chain and oxidizing phosphorylation in bacteria

- [NASA-TT-F-13187] N70-37564
- CATS**  
Cat lens motion in response to ciliary ganglion step and sinusoidal stimulation, indicating damped accommodative system A70-38925  
Desynchronized sleep phase in cats, discussing activation and hippocampal theta and hippocampal delta rhythm predominance stages A70-40171
- CELL DIVISION**  
Circadian rhythms in single cell animals, examining cell division, temperature and light effects A70-38410
- CELLS (BIOLOGY)**  
Protein solutions and cell cultures changes by ruby and Nd lasers radiation, noting threshold energy A70-39419  
Simulated space flight radiation effects on dogs DNA synthesis and bone marrow cell differentiation A70-40191  
Hepatic subcellular effects of altered atmospheres [AD-705220] N70-36211  
Heat stress effects on cellular structure and function [AD-705654] N70-36418
- CENTRAL NERVOUS SYSTEM**  
Plasma tocopherol concentrations and vitamin E deficiency in dogs, noting pathologic changes in smooth muscle, central nervous system, skeletal muscle and retina A70-38991
- CEREBRAL CORTEX**  
Visual attention and temporal cortex stimulation effects on evoked electrical activity in monkey brain A70-37812
- CEREBRAL VASCULAR ACCIDENTS**  
Cerebral and symmetric vascular dynamics in response to stress [AD-701941] N70-36397
- CEREBRUM**  
Hypoxia effects on cerebral blood flow in anesthetized dogs, considering acidosis and vasodilation A70-40330
- CESIUM 137**  
Age factor and human tolerance to radioactive contamination of diets in different European regions by strontium 90 and cesium 137 [CEA-R-3861] N70-37074
- CHEMICAL PROPERTIES**  
Physical and chemical characteristics and possible hazards from particulate matter released from Phoebus 1B - EP 4 reactor [SWRHL-46-R] N70-37340
- CHILDREN**  
Rejection of arm prosthetic devices by children with congenital deformities [FR-1103-70] N70-37224
- CHLORELLA**  
Life support systems based on Chlorella-bacterial culture, investigating water exchange and reclamation A70-40184  
Chlorella cultivation productivity N70-34994
- CHLORIDES**  
Chloride ion shift of respiration occurring between plasma and erythrocytes as function of carbon dioxide, using rapid filtration method A70-38366
- CHOLINERGICS**  
Evolution of cholinergic mediatory process in mollusks [NASA-TT-F-13192] N70-36132
- CHROMATOGRAPHY**  
Quantitative analysis of rare earth elements in plants using thermal neutron irradiation and chromatography [CEA-R-3917] N70-37015
- CIRCADIAN RHYTHMS**  
Circadian and seasonal adaptive function rhythms in animals, discussing terrestrial environment and thermoregulation A70-38409

## SUBJECT INDEX

## CONTAMINATION

- Circadian rhythms in single cell animals, examining cell division, temperature and light effects  
A70-38410
- Tyrosine content and utilization in mouse liver, showing daily rhythm in composite metabolism rate  
A70-38976
- Human sleep pattern changes due to acute sleep-waking cycle reversal  
A70-38990
- CIVIL AVIATION**
- Influences of visual angle and retinal speed on duration and intensity of illusory motion  
[AD-703634]  
N70-35354
- Operational profile and mission of certified non-instrument rated commercial pilot  
[FAA-RD-70-50]  
N70-36936
- CLEANING**
- Cleaning procedure effects on sterilization of spacecraft components  
[NASA-TM-X-53885]  
N70-37500
- CLINICAL MEDICINE**
- Multiple choice rotation chair for clinical experimental research and pilot vestibular tests  
A70-39438
- CLOSED ECOLOGICAL SYSTEMS**
- Systemic bacterial infection resistance in white mice exposed to simulated hypobaric normoxic space cabin environment  
A70-39431
- Feasibility of steam turbine for LEM environmental control system  
[NASA-TM-X-65008]  
N70-35733
- CLOTHING**
- Analysis of comfort and function factors for clothing  
[AD-703143]  
N70-36340
- COCKPITS**
- Chart and printed material legibility in cockpits for pilots  
[AM-MEMO-27]  
N70-36861
- COGNITION**
- Acute mountain sickness symptomatology and cognitive performance, using standardized General High Altitude Questionnaire  
A70-40025
- COLD ACCLIMATIZATION**
- Low ambient temperature exposure effect on hamster intestinal absorption capacity, using glucose test compound  
A70-37772
- COLD TOLERANCE**
- Effect of 3-methylisoxazole-5-carbonic acid on metabolism and thermoregulation of mice exposed to cold  
[NASA-TT-F-13158]  
N70-36110
- COLD WATER**
- Book on survival in cold water covering physiology and treatment of immersion hypothermia and drowning, thermoregulation, etc  
A70-37977
- COLD WEATHER TESTS**
- Human peripheral blood flow rewarming in cold ambient temperature, examining skin, rectal and tympanic membrane and oxygen uptake  
A70-40327
- COLOR VISION**
- Lighting and background effects on human binocular color vision of signal lights in industry  
A70-38923
- Past retinal potential luminosity functions  
[AD-703178]  
N70-35314
- COMBAT**
- Criteria for rating proficient performance of complex job in aviation combat situation  
[AD-703510]  
N70-34944
- COMBUSTION PRODUCTS**
- Toxicity problems from burning or heating of polymeric materials, discussing laboratory experiments and standardized toxicity testing procedures  
A70-39406
- COMFORT**
- Comfort plane switch mounting design for helicopter collective controls, noting mock-up evaluation by test pilots  
A70-38922
- COMPUTER PROGRAMS**
- Ballistocardiogram autocorrelation function and spectrum by scanning graph decoder and computer, determining total power, harmonics periodicity and energy concentration  
A70-38211
- Nonlinear regression analysis of biomedical data by time-sharing computers  
[AD-704858]  
N70-36541
- Computer programs for fast neutron thermalization, thermal neutron scattering, and gamma radiation damage  
[CEA-R-3994]  
N70-37113
- COMPUTERIZED SIMULATION**
- Soviet book on isolated animal heart autoregulation, considering cardio-pulmonary preparations, functional capacity, biometrics and computer technology for heart activity simulation models  
A70-37404
- Computer simulated decision hierarchical model of helicopter and VTOL pilot for multiloop closure and tracking characteristics of man-vehicle system  
A70-38921
- Digital computer model of total body ECG surface maps, simulating male torso with lungs  
A70-39369
- CONCENTRATION (COMPOSITION)**
- Transport ratio for I-131 air to milk concentrations, determining mean value and statistical variation from Project Rover data  
A70-38012
- CONDENSATES**
- Water management during flight of Apollo spacecraft  
[NASA-TM-X-64445]  
N70-35803
- CONDITIONING (LEARNING)**
- Soviet monograph on secondary signaling system role in development of speech, thought, conditioned and unconditioned reflexes, human will and hypnosis, noting salivary gland function  
A70-37407
- CONFERENCES**
- Attention and performance - Conference, Soesterberg, Netherlands, August 1969  
A70-38310
- Pathophysiology of congenital heart disease - Conference, University of California, Los Angeles, July 1967  
A70-39361
- Proceedings from symposium on inhalation carcinogenesis  
[CONF-691001]  
N70-37428
- CONFINEMENT**
- Data acquisition for confined groups of humans  
[AD-705066]  
N70-36574
- CONGENITAL ANOMALIES**
- Rejection of arm prosthetic devices by children with congenital deformities  
[FR-1103-70]  
N70-37224
- CONGRESS**
- Congressional hearings on establishing air quality criteria with respect to health and safety practices  
N70-35632
- Congressional hearings on air pollution control research in motor vehicle, aircraft, and diesel exhausts, and industrial and federal facilities wastes  
N70-36154
- CONNECTICUT**
- Air quality control standards for New Jersey, New York, and Connecticut  
[PB-191389]  
N70-37519
- CONSOLES**
- Radar consoles with various display components under different illumination levels to determine optimal operator performance, discussing push-button design recommendations  
A70-39713
- CONTAMINANTS**
- Congressional hearings on establishing air quality criteria with respect to health and safety practices  
N70-35632
- CONTAMINATION**
- Alcohol sporulation evaluation for contamination

## CONTRACTION

control in stainless steels  
[NASA-TM-X-53891] N70-37585

**CONTRACTION**  
Myocardial contractile function in rats under acute overstrain, evaluating role of preliminary training to altitude hypoxia A70-37805

**CONTROL BOARDS**  
Comfort plane switch mounting design for helicopter collective controls, noting mock-up evaluation by test pilots A70-38922

**CONTROL EQUIPMENT**  
Soviet book on man in aircraft control system covering engineering psychology, complex flight problems, human factors and instrument panels A70-37236  
Real time analog display inputs for electronic computers and tracking in physiological control circuits, describing various manual controls A70-37564

**CONTROL SIMULATION**  
Display/control technology for high performance input/output between man and machine, describing man-in-loop simulation A70-37875

**CONTROLLERS**  
Air traffic controller stress reduction, discussing work-rest intervals and various management and human factors A70-38647  
Air traffic controller role in future air traffic system, considering automation in operations A70-38649

**CONVERSATION**  
Linguistic competence of languages and performance grammars in machine conversation [P-4391] N70-36107

**COOLING**  
Portable contingency transfer life support system for crewman of Apollo missions providing oxygen and cooling A70-39441

**COOLING SYSTEMS**  
Water management during flight of Apollo spacecraft [NASA-TM-X-64445] N70-35803

**COST ESTIMATES**  
Cost estimates for air pollution control during fiscal years 1970 to 1974 [S-DOC-91-40] N70-36024

**COUCHES**  
Shock absorbing couch for body support under high acceleration or deceleration forces [NASA-CASE-XMS-01240] N70-35152

**CREWS**  
Crew training program for lunar module thermal vacuum testing [NASA-TM-X-65082] N70-35857

**CRYSTAL OSCILLATORS**  
Uncoated quartz twin crystal microbalance for monitoring water vapor content of respiratory gases A70-37844

**CULTIVATION**  
Chlorella cultivation productivity N70-34994

**CULTURE TECHNIQUES**  
Unicellular hot spring acidophilic alga Cyanidium cadarius cultured in pure carbon dioxide, examining packed cell volume, oxygen production and growth rate A70-39492  
Life support systems based on Chlorella-bacterial culture, investigating water exchange and reclamation A70-40184

**CURRENT AMPLIFIERS**  
Intracellular myocardium potentials under vagus inhibition by electrometric DC amplifiers with positive and negative feedback A70-38213

**CYTOGENESIS**  
Cells chemical origin, discussing terrestrial fractionation, amino acids, macromolecules, metabolism, etc A70-38992

**CYTOLOGY**  
Frequency and origin of somatic and genetic

## SUBJECT INDEX

radiation damage for external irradiation or after incorporation of radionuclides [EUR-4405-D] N70-36291  
Heat stress effects on cellular structure and function [AD-705654] N70-36418  
Cytochemical studies of planetary microorganisms and explorations in exobiology [NASA-CR-112847] N70-37403

**D**

**DARK ADAPTATION**  
Darkness adaptation of flight personnel in polar regions, discussing effects of physical and nervous strain, sickness and alcoholic intoxication A70-40290

**DATA ACQUISITION**  
Exhaled alveolar air data acquisition using mass spectrometer and multichannel analyzer A70-37356  
Soviet papers on physiological data collection and analysis methods A70-38206  
Data acquisition for confined groups of humans [AD-705066] N70-36574

**DATA PROCESSING**  
Soviet papers on physiological data collection and analysis methods A70-38206  
Pulse coding system for average evoked EEG potential data acquisition and analysis, describing pulse generation circuitry and computer implemented logic A70-38985  
Physiological measurements and onboard computer processing for biotelemetry control of manned space flight [JPRS-50977] N70-35982  
Design of automated physiological measuring and biotelemetry system for manned spaceship N70-35983  
Physiological measurements and algorithms for data processing in biological telemetry N70-35984

**DECISION MAKING**  
Component decision logical and temporal arrangement in visual search, defining target by several attribute value combination A70-38314  
Visual sensory storage item selection efficiency A70-38321  
Choice prediction in partially repeatable decision situations, discussing phenomenological analysis A70-38504  
Aptitude test validity taking into account selection board subjective decisions on pilot applicant acceptance A70-38507  
Complementary capabilities of man and machine for planning and creative problem solving [AD-704810] N70-34841  
Applications of decision making, probability theory, and multi-level inference systems to aerospace information processing [NASA-CR-112842] N70-37468

**DECONTAMINATION**  
Treating radioactive contamination of human organism by using tritiated water [CEA-R-3974] N70-37111

**DEGRADATION**  
Senescent Drosophila melanogaster flight muscle electron microscopic examination showing mitochondria in stages of degeneration A70-40075

**DEHYDRATED FOOD**  
Improved acceptability of feeding system of reversibly compressed, dehydrated food bars and cubes of sauces and seasonings [NASA-CR-112676] N70-36775

**DENTAL CALCULI**  
Repair of dental enamel using calcium phosphate gel [NASA-CASE-ERC-10338] N70-36053

**DEOXYRIBONUCLEIC ACID**  
Lambda prophage induction into lysogens, noting nalidixic acid role in DNA synthesis inhibition A70-39774

- Simulated space flight radiation effects on dogs  
DNA synthesis and bone marrow cell  
differentiation A70-40191
- DEPERSONALIZATION**  
Air traffic controller role in future air traffic  
system, considering automation in operations A70-38649
- DIAGNOSIS**  
Electrocardiogram vs vectorcardiogram for  
myocardial infarction diagnosis A70-38362  
Astronauts medical examination, using thermal load  
as functional and diagnostic test A70-40195
- DIALYSIS**  
Treating radioactive contamination of human  
organism by using tritiated water  
[CEA-R-3974] N70-37111
- DIAPHRAGM (ANATOMY)**  
Diaphragmatic muscle reactions and pneumogram  
changes in rats immediately after air passage  
obstruction A70-37804
- DIASTOLE**  
Cardiac ventricular function in compression pump  
terms, relating mechanical activity to end-  
diastolic fiber length A70-39364
- DIETS**  
Hypokinesia and reduced diet effects on human  
tolerance to static loads, discussing  
acceleration tolerance prediction A70-40198  
Age factor and human tolerance to radioactive  
contamination of diets in different European  
regions by strontium 90 and cesium 137  
[CEA-R-3861] N70-37074
- DIFFERENTIATORS**  
Electronic differentiator for physiological  
research, discussing electrical voltage  
derivatives reproduction, sensitivity, etc A70-38219
- DIFFUSION**  
Perfusion peristaltic pump for determining smooth  
muscle reaction in vascular bed, discussing  
applications to physiological and  
pharmacological investigations A70-38958
- DIGITAL DATA**  
Cardiac rhythm, respiration and rhythmical  
processes of alimentary tract, using digital  
data device A70-38214
- DISEASES**  
Long rhythms of periodic disparate heritable  
diseases in man A70-38414
- DISPLACEMENT**  
Electric dipole displacement of heart estimation  
by supplementing orthogonal with precordial  
lead, discussing stationary and moving point  
dipole hypotheses A70-38209
- DISPLAY DEVICES**  
Real time analog display inputs for electronic  
computers and tracking in physiological control  
circuits, describing various manual controls A70-37564  
Display/control technology for high performance  
input/output between man and machine, describing  
man-in-loop simulation A70-37875  
Human monitoring behavior, discussing display,  
task and organismic variables effects A70-38323  
TV display simulation of instrument and visual  
aircraft landing approaches, investigating  
color, collimation and resolution effects on  
pilot evaluations A70-39172  
Radar consoles with various display components  
under different illumination levels to determine  
optimal operator performance, discussing push-  
button design recommendations A70-39713  
Mathematical methods for improving sharpness of  
scintigraphic images  
[CEA-R-3920] N70-37137
- DISTILLATION EQUIPMENT**  
Vacuum distillation vapor filtered catalytic  
oxidation for water reclamation from human  
waste, using radioisotopes for thermal energy A70-39437
- DISTORTION**  
Distorting and distorted components during  
geometrical illusions stereoscopic registration A70-38926
- DOGS**  
Mongrel dogs pulmonary and systemic circulatory  
responses to dopamine infusion A70-38986  
Blood vessels constriction in rear limbs, small  
intestine and spleen of dog with arterial blood  
heated above rectal temperature A70-40173  
Skeletal muscles static tension influence on dog  
respiratory center functional properties,  
showing increased frequency volume and  
sensitivity under stimulation A70-40174  
Prolonged space flight simulation and irradiation  
effects on dogs treated with ATP and amytetraviv  
drugs N70-34990  
Aldosterone effect on hemodynamics of dogs under  
restricted movement in cages N70-34996  
Renal hemodynamic response of unanesthetized dogs  
to negative acceleration  
[AD-702745] N70-36301  
Variations in mechanical properties of canine  
abdominal vena cava  
[NASA-CR-112876] N70-37029
- DOSAGE**  
Antimotion sickness drugs evaluated for  
effectiveness under standardized stress  
conditions in slow rotation room A70-39439
- DOSIMETERS**  
Radiological physics report, including studies on  
radioelement toxicity, air pollution, Ce-137  
fallout, and dosimetry  
[ANL-7615] N70-37435
- DROSOPHILA**  
Senescent Drosophila melanogaster flight muscle  
electron microscopic examination showing  
mitochondria in stages of degeneration A70-40075
- DRUGS**  
Psychotropic drugs radioprotective effects in mice,  
noting oxygen consumption and body temperature  
decrease after X ray exposure A70-37558  
Hemodynamic effect of lidocaine given by infusion  
and bolus injections in myocardial infarction,  
examining cardiac output, heart rate, systolic  
left ventricular and aortic pressures A70-38575
- DYNAMIC CHARACTERISTICS**  
Cardiovascular blood circulation system dynamic  
characteristics analysis by linear statistical  
correlation methods, describing test for  
determining weighting function A70-39905
- DYNAMIC PRESSURE**  
Dynamic intravascular pressures measured in small  
vessels of frog lung using micropressure  
transducer inserted into vessel lumen A70-38368
- DYNAMOMETERS**  
Stabilograph and support dynamograph based on  
amplitude modulation of carrier frequency for  
standing stability determination in humans A70-38220
- E**
- EARTH ENVIRONMENT**  
Circadian and seasonal adaptive function rhythms  
in animals, discussing terrestrial environment  
and thermoregulation A70-38409  
Bibliography on natural environmental  
radioactivity  
[WASH-1061-SUPPL] N70-37126
- ECOLOGY**  
Benthic biomass and animal densities under varying



## EDEMA

- ecological conditions  
[NYO-3862-24] N70-35107
- Chemical reduction capacity of various microflora  
found in silt and soil deposits from different  
biochemical regions  
[NASA-TT-F-13197] N70-36013
- Geochemical ecology of plants  
[NASA-TT-F-13198] N70-36133
- Proposed legislation for conducting research and  
studies on ecological systems, natural  
resources, and environmental quality N70-36151

## EDEMA

- Hyperbaric oxygen exposure produced hypertension  
and pulmonary edema, discussing carbon dioxide  
transport mechanism in blood A70-39430

## EDUCATION

- ATC personnel training at International ATC  
Academy, discussing objectives and syllabus  
A70-38650
- Oxygen pressure effects on tracking control  
training for stable reactions, investigating  
muscles bioelectrical activity changes during  
elevated pressure breathing A70-40291
- Crew training program for lunar module thermal  
vacuum testing  
[NASA-TM-X-65082] N70-35857
- Two methods for instructing classifier  
[AD-700806] N70-36500
- Operational profile and mission of certified  
non-instrument rated commercial pilot  
[FAA-RD-70-50] N70-36936

## ELASTIC PROPERTIES

- Human body elastic properties effects on arterial  
pressure measurement by sphygmomanometer A70-39879

## ELECTRIC CURRENT

- Human electric shock hazards - bibliographies  
[AD-705067] N70-36575

## ELECTRIC DIPOLES

- Electrocardiography electrical bridge type leads  
system based on potential quenching phenomenon,  
determining electric dipole displacement of  
heart in transverse plane of body A70-38208
- Electric dipole displacement of heart estimation  
by supplementing orthogonal with precordial  
lead, discussing stationary and moving point  
dipole hypotheses A70-38209

## ELECTRIC FILTERS

- HF ballistocardiograms resonance distortions  
correction, using electrical selective filters A70-38210

## ELECTRIC NETWORKS

- Adaptive controller machine based on application  
of generalized punishments or rewards  
[AD-703758] N70-35311

## ELECTRIC WIRE

- Electrocardiography leads system optimal selection  
based on electrophysical modeling A70-38207
- Electrocardiography electrical bridge type leads  
system based on potential quenching phenomenon,  
determining electric dipole displacement of  
heart in transverse plane of body A70-38208
- Electric dipole displacement of heart estimation  
by supplementing orthogonal with precordial  
lead, discussing stationary and moving point  
dipole hypotheses A70-38209

- Cardiovascular stress testing using posterior  
bipolar lead for radiotelemetry monitoring A70-39199

## ELECTROCARDIOGRAPHY

- Electrocardiography leads system optimal selection  
based on electrophysical modeling A70-38207
- Electrocardiography electrical bridge type leads  
system based on potential quenching phenomenon,  
determining electric dipole displacement of  
heart in transverse plane of body A70-38208
- Electrocardiogram vs vectorcardiogram for  
myocardial infarction diagnosis A70-38362

## SUBJECT INDEX

- Circadian rhythms from electrocardiogram and  
cardiotachogram of patient with human heart  
transplant, noting P waves relationship between  
donor and recipient tissues A70-39166
- Isopotential surface maps for body surface  
potential relation to ECG and Frank  
vectorcardiogram during QRS stages in children A70-39368
- Digital computer model of total body ECG surface  
maps, simulating male torso with lungs A70-39369
- Human arterial hypertension, correlating ECG  
changes with systemic hemodynamics A70-40069
- Electrolyteless ultrasonic Doppler biotelemetry  
cardiography system N70-35004
- ELECTRODES**  
Electrocardiography leads system optimal selection  
based on electrophysical modeling A70-38207
- ELECTROENCEPHALOGRAPHY**  
EEG analysis for poststimulus events, examining  
contingent negative variation and late positive  
wave of average evoked potential A70-37813
- Multipoint recording of bioelectric potentials  
based on electroencephalography, discussing  
multiple leadout, amplification, analysis, etc A70-38217
- Electroencephalography with automatic frequency  
analysis to simulate processes involving brain  
self regulation A70-38218
- Enhanced evoked potentials sited by auditory  
stimuli in complex task, considering EEG and  
neurophysiological basis of selective attention A70-38318
- Noise effects on arousal level in auditory  
vigilance from EEG parameters A70-38325
- Pulse coding system for average evoked EEG  
potential data acquisition and analysis,  
describing pulse generation circuitry and  
computer implemented logic A70-38985
- Electrophysiological parameter changes after  
disturbance of motor conditioned reaction rhythm  
in man N70-37064
- ELECTROLYTES**  
Portable battery operated system for rapid  
measurements of blood plasma electrolytes during  
aeromedical evacuation A70-39433
- Myocardial Na and K content of rats exposed to  
high altitude, preparing isolated right  
ventricular strip A70-40541
- ELECTROMYOGRAPHY**  
Electrophysiological parameter changes after  
disturbance of motor conditioned reaction rhythm  
in man N70-37064
- ELECTRON MICROSCOPES**  
Senescent Drosophila melanogaster flight muscle  
electron microscopic examination showing  
mitochondria in stages of degeneration A70-40075
- Hepatic subcellular effects of altered atmospheres  
[AD-705220] N70-36211
- ELECTRON PARAMAGNETIC RESONANCE**  
Free radicals/radiation dosage linear relationship  
in alanine using electron paramagnetic resonance  
for biological tissue radiation damage study  
[CEA-R-3913] N70-36998
- ELECTRONIC EQUIPMENT**  
Electronic differentiator for physiological  
research, discussing electrical voltage  
derivatives reproduction, sensitivity, etc A70-38219
- ELECTROPHYSICS**  
Electrocardiography leads system optimal selection  
based on electrophysical modeling A70-38207
- ELECTRORETINOGRAPHY**  
Fast retinal potential luminosity functions  
[AD-703178] N70-35314

# SUBJECT INDEX

# FEEDBACK AMPLIFIERS

**ENDOCRINE GLANDS**  
 Ionizing radiation effects on endocrine system, studying ACTH metabolism in rats under X ray irradiation  
 A70-38723

**ENERGY BUDGETS**  
 Human bioclimatology at high altitude, discussing energy balance in terms of net solar and terrestrial radiation balance in mountain area  
 A70-37369

**ENERGY DISSIPATION**  
 Human body core temperature control dependence during exercise on heat dissipation, noting sweating control  
 A70-38997

**ENGINE NOISE**  
 Ship engineers cardiovascular system functional changes during HF internal combustion engine noise, investigating EKG recordings and arterial pressure  
 A70-40292

**ENVIRONMENTAL CONTROL**  
 Effect of cabin pressure on environmental control system  
 [NASA-TM-X-65009] N70-35804  
 Cost estimates for air pollution control during fiscal years 1970 to 1974  
 [S-DOC-91-40] N70-36024  
 Progress in air pollution control  
 [S-DOC-91-11] N70-36025  
 Air pollution threat in Sacramento, California, projected population, vehicles, and activities  
 [PB-191382] N70-37433

**ENVIRONMENTAL INDEX**  
 Proposed legislation for conducting research and studies on ecological systems, natural resources, and environmental quality  
 N70-36151

**ENVIRONMENTAL TESTS**  
 Manned testing of flight breadboard oxygen system  
 [NASA-CR-73395] N70-36933

**ENZYME ACTIVITY**  
 Anomalous substrate oxidizing specificities among red brown and green algal peroxidases and land plants  
 A70-37773  
 Lighting effects on phenylethanolamine-N-methyltransferase /PNMT/ activity and adrenal epinephrine content in rats  
 A70-38982  
 Acetylcholinesterase and simple esterases distribution in squirrel monkey brain, examining activity in neuropil and postrema area neurons  
 A70-38993

**ENZYMES**  
 Enzymatic activity in model with lipid membrane separating ribonuclease enzyme from RNA substrate  
 [NASA-TT-F-13185] N70-37471  
 Enzyme system of respiratory chain and oxidizing phosphorolysis in bacteria  
 [NASA-TT-F-13187] N70-37564

**EPIDEMIOLOGY**  
 Epidemiologic and experimental studies of radiation bio-effects  
 [PB-190110] N70-37320

**EPINEPHRINE**  
 Lighting effects on phenylethanolamine-N-methyltransferase /PNMT/ activity and adrenal epinephrine content in rats  
 A70-38982

**ERROR ANALYSIS**  
 Preliminary taxonomy for errors in serial, self-paced choice reaction time experiments, discussing speed-error tradeoff  
 A70-38313  
 Human mass exchange parameters permissible errors for manned space vehicles life support systems design  
 A70-40200

**ERYTHROCYTES**  
 Chloride ion shift of respiration occurring between plasma and erythrocytes as function of carbon dioxide, using rapid filtration method  
 A70-38366  
 External measurement of Fe-59 ferrokinetics  
 [AD-705046] N70-36467

**ETHYLENE**  
 Auxin downward transport by gravity in leaves,

examining ethylene inhibition  
 A70-39234

**EXHAUST GASES**  
 Congressional hearings on air pollution control research in motor vehicle, aircraft, and diesel exhausts, and industrial and federal facilities wastes  
 N70-36154

**EXO BIOLOGY**  
 Biomedical foundations of manned space flight  
 [AD-703316] N70-35340  
 Anthropometric determinations of American born Macaca mulatta for orbiting primate experiment  
 [AD-700907] N70-36495  
 Cytochemical studies of planetary microorganisms and explorations in exobiology  
 [NASA-CR-112847] N70-37403

**EXPERIMENTAL DESIGN**  
 Attention theory experimental design logic, discussing quantitative theory  
 A70-38315  
 Auditory direction finding ability, discussing experimental arrangement, white noise production, test conduction and statistical evaluation  
 A70-40538

**EXPIRED AIR**  
 Exhaled alveolar air data acquisition using mass spectrometer and multichannel analyzer  
 A70-37356  
 Uncoated quartz twin crystal microbalance for monitoring water vapor content of respiratory gases  
 A70-37844

**EXTRATERRESTRIAL LIFE**  
 Cytochemical studies of planetary microorganisms and explorations in exobiology  
 [NASA-CR-112847] N70-37403

**EXTRAVEHICULAR ACTIVITY**  
 Simulation test report for multiple docking adapter external handrail system evaluation  
 [NASA-TM-X-53894] N70-37533

**EYE (ANATOMY)**  
 Cat lens motion in response to ciliary ganglion step and sinusoidal stimulation, indicating damped accommodative system  
 A70-38925  
 Ruby laser radiation injury relationship to position and number of energy absorbing pigment particles in iris  
 A70-39425

**EYE MOVEMENTS**  
 Eye movements during visual search and meaningless pattern discrimination  
 A70-38054  
 Retinal images smearing during voluntary saccadic eye movements, obtaining thresholds for horizontal and vertical stimuli bands  
 A70-38927  
 Visual suppression linear dependence on angular size of voluntary saccadic eye movements, observing percentage of trials for stimulus perception  
 A70-38928  
 Temporal and spatial distribution of visual suppression during voluntary saccadic eye movement on different places of retina  
 A70-38929  
 Pilot scanning dwell times and control workload in simulated instrument approach, using eye-point-of-regard /EPR/ measurements  
 [AIAA PAPER 70-999] A70-39532

**F**

**FACILITIES**  
 Fundamentals of accident prevention  
 N70-37216

**FACTOR ANALYSIS**  
 Adaptive mathematical model development for deriving automated pilot performance measurement techniques  
 [AD-704597] N70-36244

**FASTENERS**  
 Lightweight life preserver without fastening devices  
 [NASA-CASE-XMS-00864] N70-36493

**FEEDBACK AMPLIFIERS**  
 Intracellular myocardium potentials under vagus

## FIRST AID

inhibition by electrometric DC amplifiers with positive and negative feedback

A70-38213

## FIRST AID

Industrial safety hazards of group and individual inorganic acids with control and preventive measures

N70-36635

## FISHES

Benthic biomass and animal densities under varying ecological conditions  
[NYO-3862-24]

N70-35107

## FIXED WINGS

Evaluation of integrated contact-instrument concept for Army fixed wing flight instruction  
[AD-703161]

N70-36454

## FLIGHT CONTROL

Evaluation of integrated contact-instrument concept for Army fixed wing flight instruction  
[AD-703161]

N70-36454

## FLIGHT CREWS

Criteria for rating proficient performance of complex job in aviation combat situation  
[AD-703510]

N70-34944

## FLIGHT INSTRUMENTS

Soviet book on man in aircraft control system covering engineering psychology, complex flight problems, human factors and instrument panels

A70-37236

Evaluation of integrated contact-instrument concept for Army fixed wing flight instruction  
[AD-703161]

N70-36454

## FLIGHT SIMULATION

Pilot scanning dwell times and control workload in simulated instrument approach, using eye-point-of-regard/EPR/measurements  
[AIAA PAPER 70-999]

A70-39532

Prolonged space flight simulation and irradiation effects on dogs treated with ATP and amytravil drugs

N70-34990

## FLIGHT SIMULATORS

Adaptive mathematical model development for deriving automated pilot performance measurement techniques  
[AD-704597]

N70-36244

## FLIGHT TIME

Astronaut weight loss relation to flight duration during manned space missions

A70-40125

## FLIGHT TRAINING

Flight training quality prediction by multidimensional regression analysis, discussing relationship to candidates psychophysiological examinations

A70-38964

Task signal rate effects on human monitoring of static process  
[AD-703635]

N70-35091

Evaluation of integrated contact-instrument concept for Army fixed wing flight instruction  
[AD-703161]

N70-36454

## FLOW MEASUREMENT

Thermal electronic instrumentation applied to biological flows including blood flow, cardiac outputs and volumes

A70-37843

Radio telemetry measurements of blood pressure and flow in unrestrained animals

A70-39370

## FLOWMETERS

Electromagnetic blood flowmeters for circulatory research

A70-39371

## FLUID FLOW

Microorganism transport through small orifices in bio-barrier fluid flow  
[NASA-CR-66703]

N70-35877

## FLUID INJECTION

Vestibular thermal stimulation method using distilled water injected into ear, discussing nystagmus appearance and duration

A70-37355

## FLYING PERSONNEL

Darkness adaptation of flight personnel in polar regions, discussing effects of physical and nervous strain, sickness and alcoholic intoxication

A70-40290

## SUBJECT INDEX

## FOOD

Sterilization and storage effects on nutritional value of canned foods  
[R-3092]

N70-35577

## FRAGMENTATION

Geometrical figure fragmentation produced by intermittent illumination, examining dependence on presentation frequency and temporal factors

A70-39491

## FREE ATMOSPHERE

Dispersion pattern of aerosol particles in free atmosphere  
[AD-702332]

N70-35421

## FREE RADICALS

Free radicals/radiation dosage linear relationship in alanine using electron paramagnetic resonance for biological tissue radiation damage study  
[CEA-R-3913]

N70-36998

## FREQUENCY RESPONSE

Rat neuron impulsive reactions and frequency response differences to varying sound signals, discussing time constant, signal intensity and frequencies

A70-40172

## G

## GAMMA RAYS

Human body radioactive nuclides in vivo quantitative analysis by gamma ray spectra, considering matrix method accuracy

A70-40449

Effectiveness of thermoradiation sterilization of spacecraft hardware  
[NASA-CR-109972]

N70-35167

Stability of new compounds derived from uracil and thiouracil after gamma ray irradiation  
[CEA-R-3962]

N70-37080

Computer programs for fast neutron thermalization, thermal neutron scattering, and gamma radiation damage  
[CEA-R-3994]

N70-37113

## GAS LASERS

He-Ne laser beam hazard to human retina

A70-38309

## GAS MIXTURES

Orthostatic tolerance increase in animals by application of hyperoxic and hypercapnic gas mixtures

A70-40185

Incidence of hypoxia and hypercapnia at ambient temperature in white mice and rats in nitrogen-oxygen or helium-oxygen atmospheres

N70-34992

## GAS PRESSURE

Reliability tests of blood carbon dioxide pressure measurement methods, indicating carbon dioxide-electrode method superiority

A70-38371

## GAS TRANSPORT

Hyperbaric oxygen exposure produced hypertension and pulmonary edema, discussing carbon dioxide transport mechanism in blood

A70-39430

## GASTROINTESTINAL SYSTEM

Low ambient temperature exposure effect on hamster intestinal absorption capacity, using glucose test compound

A70-37772

Cardiac rhythm, respiration and rhythmical processes of alimentary tract, using digital data device

A70-38214

Absorption, distribution, and elimination of glycine by rats after exposure to hypoxia

N70-34998

## GELS

Repair of dental enamel using calcium phosphate gel  
[NASA-CASE-ERC-10338]

N70-36053

## GEMINI 11 FLIGHT

Genetic effects of radiation dosage on Neurospora during Gemini 11 and biosatellite 2 missions  
[NASA-CR-112354]

N70-36826

## GENETICS

Frequency and origin of somatic and genetic radiation damage for external irradiation or after incorporation of radionuclides  
[EUR-4405-D]

N70-36291



# SUBJECT INDEX

# HEART FUNCTION

- Genetic effects of radiation dosage on *Neurospora* during Gemini 11 and biosatellite 2 missions  
[NASA-CR-112354] N70-36826
- GEOCHEMISTRY**  
Chemical reduction capacity of various microflora found in silt and soil deposits from different biochemical regions  
[NASA-TT-F-13197] N70-36013  
Geochemical ecology of plants  
[NASA-TT-F-13198] N70-36133
- GEOTROPISM**  
Mechanisms controlling orientation of side roots and other plagiotropic plant parts in geotropic critical angle  
[NASA-TT-F-12639] N70-36014
- GLUCOSE**  
Mathematical model of human pituitary gland mechanism controlling secretions of serum growth hormone in response to glucose deficiency  
A70-38995  
Human gluco-regulatory hormone reserve depressions following acute and chronic acceleration exposure  
A70-39436  
Fasting plasma glucose concentration in rats after chronic hypoxia  
A70-40542
- GLUCOSIDES**  
Ca ion reversible effects of hydrochloric acid and ammonia water on betacyanin leakage from beetroot sections  
A70-38375
- GLYCINE**  
Absorption, distribution, and elimination of glycine by rats after exposure to hypoxia  
N70-34998
- GOVERNMENTS**  
Proposed legislation for conducting research and studies on ecological systems, natural resources, and environmental quality  
N70-36151
- GRAVITATIONAL EFFECTS**  
Auxin downward transport by gravity in leaves, examining ethylene inhibition  
A70-39234  
Changing gravity and weightlessness effects on vasopressin control systems, with immunochemical and biological assay studies  
[NASA-CR-112358] N70-36764
- GROUP DYNAMICS**  
Bibliography on small group dynamics - Vol. 1  
[AD-703600] N70-35482
- GROWTH**  
Serum growth hormone response to hypoglycemia in man following insulin administration, reviewing lumped parameter model  
A70-38006  
Unicellular hot spring acidophilic alga *Cyanidium* *cadarium* cultured in pure carbon dioxide, examining packed cell volume, oxygen production and growth rate  
A70-39492  
Hydrostatic pressure effects on photosynthesis and growth of unicellular marine algae and diatoms  
[AD-704496] N70-36546

# H

- HABITUATION (LEARNING)**  
State-of-the-art review on habituation processes and vestibular adaptation  
N70-34989
- HANDLES**  
Simulation test report for multiple docking adapter external handrail system evaluation  
[NASA-TM-X-53894] N70-37533
- HARMONIC ANALYSIS**  
Nonlinear analysis of pressure waves and shock waves in blood vessels  
[NASA-CR-112864] N70-36857
- HARNESSES**  
Development of nylon-linen webbing material for restraint harness in Apollo spacecraft  
[NASA-TM-X-64437] N70-35661  
Industrial safety harness assessment for aircraft serving personnel  
[FPRC/EMO-246] N70-36510
- HAZARDS**  
Human electric shock hazards - bibliographies

- [AD-705067] N70-36575  
Industrial safety hazards of group and individual inorganic acids with control and preventive measures  
N70-36635
- HEAD (ANATOMY)**  
Measurement of head angular acceleration during impact  
[AD-704704] N70-36249
- HEAD MOVEMENT**  
Adjustable headholder for semicircular canal caloric testing  
[AD-700738] N70-36435
- HEADACHE**  
Nocturnal headache relationship to REM sleep stage from EEG, EOG and EMG data  
A70-38994
- HEALTH PHYSICS**  
Sound level measurements in industrial plants  
[TR-6910.386] N70-35320  
Physical and chemical characteristics and possible hazards from particulate matter released from Phoebus 1B - EP 4 reactor  
[SWRHL-46-R] N70-37340
- HEARING**  
Sound level measurements in industrial plants  
[TR-6910.386] N70-35320
- HEART**  
Electrocardiography electrical bridge type leads system based on potential quenching phenomenon, determining electric dipole displacement of heart in transverse plane of body  
A70-38208  
Electric dipole displacement of heart estimation by supplementing orthogonal with precordial lead, discussing stationary and moving point dipole hypotheses  
A70-38209
- HEART DISEASES**  
Cutaneous liquid crystal temperature sensors for thermographic patterns of angina pectoris induced by treadmill exercise  
A70-38361  
Circadian rhythms from electrocardiogram and cardiograph of patient with human heart transplant, noting P waves relationship between donor and recipient tissues  
A70-39166  
Pathophysiology of congenital heart disease - Conference, University of California, Los Angeles, July 1967  
A70-39361  
Pulmonary hypertension in congenital heart diseases as function of blood flow  
A70-39367  
Heart pathology and myocardial infarction research, including data management and animal studies  
[PB-190112] N70-37576
- HEART FUNCTION**  
Soviet book on isolated animal heart autoregulation, considering cardio-pulmonary preparations, functional capacity, biometrics and computer technology for heart activity simulation models  
A70-37404  
Cardiac rhythm, respiration and rhythmical processes of alimentary tract, using digital data device  
A70-38214  
Cardiac contraction rhythm autocorrelation and spectral analysis in healthy subjects and patients with disturbed sinus node functional states  
A70-38963  
Mechanical analysis involving clamping apparatus for cardiac muscle contractile response  
A70-39362  
Muscular mechanics of intact heart contraction, discussing effects of altered fiber length, afterload and inotropic state  
A70-39363  
Cardiac ventricular function in compression pump terms, relating mechanical activity to end-diastolic fiber length  
A70-39364  
Ultrasonic nonsearch Doppler cardiography for cycle phase analysis, recording single functions  
A70-40199

## HEART MINUTE VOLUME

Heart stroke volume estimation at submaximal exercise using blood hemoglobin content and heart rate  
A70-40328

HEART MINUTE VOLUME  
Circulating blood volume and heart minute and stroke volumes in rabbits, using isotope-labeled albumin  
A70-38724

HEART RATE  
Heart stroke volume estimation at submaximal exercise using blood hemoglobin content and heart rate  
A70-40328

Athletes ventilation and heart rate dynamic responses to supine leg exercise with sinusoidal work load  
A70-40329

Nitrogen trifluoride effects on rat cardiovascular system  
[AD-705045]  
N70-36468

HEAT TOLERANCE  
Thermal thermesthesiometer for skin heat sensibility studies  
A70-37806

Heat stress effects on serial reaction time in subjects performing visual tasks  
A70-38053

Astronauts medical examination, using thermal load as functional and diagnostic test  
A70-40195

Heat stress effects on cellular structure and function  
[AD-705654]  
N70-36418

HEATING EQUIPMENT  
Microwave feeding system for heating and cooking prepackaged meals during extended space missions  
A70-37747

HELICOPTER CONTROL  
Computer simulated decision hierarchical model of helicopter and VTOL pilot for multiloop closure and tracking characteristics of man-vehicle system  
A70-38921

Comfort plane switch mounting design for helicopter collective controls, noting mock-up evaluation by test pilots  
A70-38922

HEMATOLOGY  
Portable battery operated system for rapid measurements of blood plasma electrolytes during aeromedical evacuation  
A70-39433

HEMODYNAMIC RESPONSES  
Hemodynamic changes in Andean native after two years at sea level, measuring intravascular pressures, cardiac output, heart rate and stroke index  
A70-39427

Renal hemodynamic response of unanesthetized dogs to positive accelerations within physiological tolerance range, measuring pressure and blood flow velocity  
A70-40332

Renal hemodynamic response of unanesthetized dogs to negative acceleration  
[AD-702745]  
N70-36301

HEMODYNAMICS  
Hemodynamic effect of lidocaine given by infusion and bolus injections in myocardial infarction, examining cardiac output, heart rate, systolic left ventricular and aortic pressures  
A70-38575

Circulating blood volume and heart minute and stroke volumes in rabbits, using isotope-labeled albumin  
A70-38724

Human arterial hypertension, correlating ECG changes with systemic hemodynamics  
A70-40069

Aldosterone effect on hemodynamics of dogs under restricted movement in cages  
N70-34996

HEMOGLOBIN  
Carbon dioxide content of dialyzed human hemoglobin measured at specific pressure and varying pH values as function of 2,3 diphosphoglycerate  
A70-38367

## SUBJECT INDEX

Heart stroke volume estimation at submaximal exercise using blood hemoglobin content and heart rate  
A70-40328

HEMOLYSIS  
Erythrocyte suspension subjected to gas bubble ultrasonic oscillation, investigating hemolysis mechanism  
A70-39981

HEREDITY  
Long rhythms of periodic disparate heritable diseases in man  
A70-38414

HIGH ALTITUDE ENVIRONMENTS  
Human bioclimatology at high altitude, discussing energy balance in terms of net solar and terrestrial radiation balance in mountain area  
A70-37369

Acute mountain sickness symptomatology and cognitive performance, using standardized General High Altitude Questionnaire  
A70-40025

Mice immunobiological reactivity at simulated high altitude  
A70-40189

Myocardial Na and K content of rats exposed to high altitude, preparing isolated right ventricular strip  
A70-40541

RNA concentration and protein synthesis in brain and memory retention under high altitude hypoxia stress  
N70-34997

HIGH PRESSURE OXYGEN  
Prolonged hyperbaric oxygen breathing effect on human physical performance at rest and during severe exercise  
A70-38369

HIGH TEMPERATURE ENVIRONMENTS  
Hypoxia and high ambient temperature effects on altitude tolerance in animals  
A70-40186

High temperature effects on performance of complex tasks by senior pilots  
[AD-703632]  
N70-35090

HIPPOCAMPUS  
Desynchronized sleep phase in cats, discussing activation and hippocampal theta and hippocampal delta rhythm predominance stages  
A70-40171

HOMEOSTASIS  
Axiomatic approach to homeostasis, discussing living systems as oscillators with input-output and transit variables in duration and elongation  
A70-38411

HORMONE METABOLISMS  
Ionizing radiation effects on endocrine system, studying ACTH metabolism in rats under X ray irradiation  
A70-38723

Human gluco-regulatory hormone reserve depressions following acute and chronic acceleration exposure  
A70-39436

HORMONES  
Serum growth hormone response to hypoglycemia in man following insulin administration, reviewing lumped parameter model  
A70-38006

Mathematical model of human pituitary gland mechanism controlling secretions of serum growth hormone in response to glucose deficiency  
A70-38995

Auxin downward transport by gravity in leaves, examining ethylene inhibition  
A70-39234

HUMAN BEHAVIOR  
Soviet monograph on secondary signaling system role in development of speech, thought, conditioned and unconditioned reflexes, human will and hypnosis, noting salivary gland function  
A70-37407

Human monitoring behavior, discussing display, task and organismic variables effects  
A70-38323

Personality correlates of centering of self in phenomenal field  
[AD-705065]  
N70-36551

# SUBJECT INDEX

# HUMAN REACTIONS

Data acquisition for confined groups of humans  
[AD-705066] N70-36574

**HUMAN BEINGS**

Manned testing of flight breadboard oxygen system  
[NASA-CR-73395] N70-36933

**HUMAN BODY**

Human body core temperature control dependence during exercise on heat dissipation, noting sweating control A70-38997

Human body elastic properties effects on arterial pressure measurement by sphygmomanometer A70-39879

Human body radioactive nuclides in vivo quantitative analysis by gamma ray spectra, considering matrix method accuracy A70-40449

Weight, volume, and center of mass of segments of human body  
[NASA-CR-112672] N70-36813

**HUMAN FACTORS ENGINEERING**

Soviet book on man in aircraft control system covering engineering psychology, complex flight problems, human factors and instrument panels A70-37236

Air traffic controller stress reduction, discussing work-rest intervals and various management and human factors A70-38647

Human factors in ATC, discussing simulation trials and impending problems A70-38648

Comfort plane switch mounting design for helicopter collective controls, noting mock-up evaluation by test pilots A70-38922

Radar consoles with various display components under different illumination levels to determine optimal operator performance, discussing push-button design recommendations A70-39713

Human mass exchange parameters permissible errors for manned space vehicles life support systems design A70-40200

Psychological effects of assigning unexpected tasks to operator in simulated space flight environment N70-35000

Shock absorbing couch for body support under high acceleration or deceleration forces  
[NASA-CASE-XMS-01240] N70-35152

Analysis of comfort and function factors for clothing  
[AD-703143] N70-36340

Human electric shock hazards - bibliographies  
[AD-705067] N70-36575

**HUMAN PATHOLOGY**

Long rhythms of periodic disparate heritable diseases in man A70-38414

**HUMAN PERFORMANCE**

Equidistance effects on human size and distance perception in visual alley A70-37771

Heat stress effects on serial reaction time in subjects performing visual tasks A70-38053

Response bias of conservative human inference, using revised odds estimate experiments A70-38055

Stabilograph and support dynamograph based on amplitude modulation of carrier frequency for standing stability determination in humans A70-38220

Attention and performance - Conference, Soesterberg, Netherlands, August 1969 A70-38310

Component decision logical and temporal arrangement in visual search, defining target by several attribute value combination A70-38314

Attention theory experimental design logic, discussing quantitative theory A70-38315

Optimum attention allocation, discussing distraction resistance and multiple task performance A70-38316

Performance and response organization as uncertainty and structure function in pursuit tracking tasks A70-38320

Human memory information structure, discussing pattern recognition, simultaneous attention, problem solving and logic A70-38322

Human vigilance paradigm and physiology, discussing relationships between vigilance, signal detection and animal discrimination A70-38324

Prolonged hyperbaric oxygen breathing effect on human physical performance at rest and during severe exercise A70-38369

Lighting and background effects on human binocular color vision of signal lights in industry A70-38923

Brightness contrast by human observer binocular matching, discussing neural networks models A70-38924

Choice reaction and movement time dependence on hypoxia induced by air pressure reduction inside decompression chamber, discussing adult human performance A70-39714

Acute mountain sickness symptomatology and cognitive performance, using standardized General High Altitude Questionnaire A70-40025

Task signal rate effects on human monitoring of static process  
[AD-703635] N70-35091

Bibliography on reaction time in human information processing tasks  
[AD-703857] N70-35375

Laboratory and field studies for data acquisition on tank crews during combat operations  
[AD-705705] N70-36449

Geographic orientation in air operations for military aircraft systems  
[AD-705021] N70-36457

Space simulator to produce visual properties of objects outside earth atmosphere and determine distance and rate perception  
[NASA-CR-112843] N70-37467

**HUMAN REACTIONS**

Decreased mental and physical performance of human beings due to T-oral and placebo vaccine reactions A70-37389

Human spatio-temporal visual evoked response characteristics, showing potential gradient rotation in same period as input stimulus A70-37845

Human brain LF activity in visual evoked response, determining relationship to stimulation A70-37846

Human response time to visual stimulus preceding or following auditory stimulus as function of interstimulus interval A70-38311

Reaction time intersensory facilitation relationship to single channel theories of attention and human performance A70-38312

Preliminary taxonomy for errors in serial, self-paced choice reaction time experiments, discussing speed-error tradeoff A70-38313

Human sleep pattern changes due to acute sleep-waking cycle reversal A70-38990

Frank orthogonal vectorcardiograms on humans during acceleration, using beat-by-beat real time analog-digital computer technique A70-39435

Human gluco-regulatory hormone reserve depressions following acute and chronic acceleration exposure A70-39436

Ship engineers cardiovascular system functional changes during HF internal combustion engine noise, investigating EKG recordings and arterial pressure A70-40292

Human peripheral blood flow rewarming in cold ambient temperature, examining skin, rectal and



## HUMAN TOLERANCES

- tympanic membrane and oxygen uptake  
A70-40327
- Mineral and water metabolism in humans after exposure to transverse acceleration  
N70-35002
- Stress effects on human nervous system and physiological responses  
[JPRS-51067]  
N70-37063
- Electrophysiological parameter changes after disturbance of motor conditioned reaction rhythm in man  
N70-37064
- Rheoencephalographic changes as indication of psychic stress  
N70-37065
- HUMAN TOLERANCES**
- Antimotion sickness drugs evaluated for effectiveness under standardized stress conditions in slow rotation room  
A70-39439
- Temporal and spectra combination effects on aircraft sound judged noisiness, using human subjects in anechoic chamber  
A70-39712
- Preliminary physical training for human water immersion resistance improvement  
A70-40196
- Atmospheric composition cyclic changes effects on human basal metabolism under hypokinesia  
A70-40197
- Hypokinesia and reduced diet effects on human tolerance to static loads, discussing acceleration tolerance prediction  
A70-40198
- Laboratory and field studies for data acquisition on tank crews during combat operations  
[AD-705705]  
N70-36449
- Age factor and human tolerance to radioactive contamination of diets in different European regions by strontium 90 and cesium 137  
[CEA-R-3861]  
N70-37074
- HUMAN WASTES**
- Vacuum distillation vapor filtered catalytic oxidation for water reclamation from human waste, using radioisotopes for thermal energy  
A70-39437
- HYDROCHLORIC ACID**
- Ca ion reversible effects of hydrochloric acid and ammonia water on betacyanin leakage from beetroot sections  
A70-38375
- HYDROSTATIC PRESSURE**
- Hydrostatic pressure effects on photosynthesis and growth of unicellular marine algae and diatoms  
[AD-704496]  
N70-36546
- HYPERCAPNIA**
- Orthostatic tolerance increase in animals by application of hyperoxic and hypercapnic gas mixtures  
A70-40185
- Incidence of hypoxia and hypercapnia at ambient temperature in white mice and rats in nitrogen-oxygen or helium-oxygen atmospheres  
N70-34992
- HYPEROXIA**
- Hyperbaric oxygen exposure produced hypertension and pulmonary edema, discussing carbon dioxide transport mechanism in blood  
A70-39430
- Orthostatic tolerance increase in animals by application of hyperoxic and hypercapnic gas mixtures  
A70-40185
- HYPERTENSION**
- Pulmonary hypertension in congenital heart diseases as function of blood flow  
A70-39367
- Hyperbaric oxygen exposure produced hypertension and pulmonary edema, discussing carbon dioxide transport mechanism in blood  
A70-39430
- Human arterial hypertension, correlating ECG changes with systemic hemodynamics  
A70-40069
- HYPOGLYCEMIA**
- Serum growth hormone response to hypoglycemia in man following insulin administration, reviewing lumped parameter model  
A70-38006

## SUBJECT INDEX

## HYPOKINESIA

- Hypokinesia effects on rats protein synthesis rates, determining body and organ weights, muscle tissue nitrogen content and transaminase activity  
A70-40187
- Atmospheric composition cyclic changes effects on human basal metabolism under hypokinesia  
A70-40197
- Hypokinesia and reduced diet effects on human tolerance to static loads, discussing acceleration tolerance prediction  
A70-40198

## HYPOTHERMIA

- Book on survival in cold water covering physiology and treatment of immersion hypothermia and drowning, thermoregulation, etc  
A70-37977

## HYPOXIA

- Myocardial contractile function in rats under acute overstrain, evaluating role of preliminary training to altitude hypoxia  
A70-37805
- Hypoxia effects on aviators visual accommodation, convergence and stereoacuity, noting myopia increase with altitude  
A70-38996
- Hypobaric hypoxia effects on MM virus infection resistance in mice  
A70-39428
- Hypoxia warning systems using polarographic sensor and miniaturized electronics for face-mask and cabin installation for aircraft and spacecraft  
A70-39429
- Choice reaction and movement time dependence on hypoxia induced by air pressure reduction inside decompression chamber, discussing adult human performance  
A70-39714
- Hypoxia and high ambient temperature effects on altitude tolerance in animals  
A70-40186
- Hypoxia effects on cerebral blood flow in anesthetized dogs, considering acidosis and vasodilation  
A70-40330
- Fasting plasma glucose concentration in rats after chronic hypoxia  
A70-40542
- Incidence of hypoxia and hypercapnia at ambient temperature in white mice and rats in nitrogen-oxygen or helium-oxygen atmospheres  
N70-34992
- RNA concentration and protein synthesis in brain and memory retention under high altitude hypoxia stress  
N70-34997
- Absorption, distribution, and elimination of glycine by rats after exposure to hypoxia  
N70-34998

## ICE

- Portable dry ice, water conditioned suit system  
[AD-700915]  
N70-36364

## IDENTIFYING

- 3-O-methyl-mannose neutral sugar identification as constituent of fungal polysaccharide  
A70-39625

## ILLUMINATING

- Lighting and background effects on human binocular color vision of signal lights in industry  
A70-38923

## ILLUMINATION

- Geometrical figure fragmentation produced by intermittent illumination, examining dependence on presentation frequency and temporal factors  
A70-39491
- Radar consoles with various display components under different illumination levels to determine optimal operator performance, discussing push-button design recommendations  
A70-39713

## ILLUSIONS

- Distorting and distorted components during geometrical illusions stereoscopic registration  
A70-38926

- Imaginary axes effect of phenomenal space in contrast illusions of distance, discussing division of S field of vision by definite point fixation  
A70-39764
- IMAGE CONTRAST**  
Brightness contrast by human observer binocular matching, discussing neural networks models  
A70-38924  
Retinal images smearing during voluntary saccadic eye movements, obtaining thresholds for horizontal and vertical stimuli bands  
A70-38927
- IMAGE ENHANCEMENT**  
Mathematical methods for improving sharpness of scintigraphic images  
[CEA-R-3920]  
N70-37137
- IMAGES**  
Preliminary conversion of images in visual imaging identification system  
[AD-703380]  
N70-35362
- IMAGING TECHNIQUES**  
Preliminary conversion of images in visual imaging identification system  
[AD-703380]  
N70-35362
- IMMOBILIZATION**  
Macroscopic architectural changes of cancellous and cortical bone in Rhesus monkey following long term immobilization and chemical removal of calcium  
A70-38983
- IMMUNITY**  
Hypobaric hypoxia effects on MM virus infection resistance in mice  
A70-39428
- IMMUNOLOGY**  
Antigens immunological response during myocardial infarction  
A70-39151  
Mice immunobiological reactivity at simulated high altitude  
A70-40189
- IMPACT DAMAGE**  
Measurement of head angular acceleration during impact  
[AD-704704]  
N70-36249
- INDEPENDENT VARIABLES**  
Human monitoring behavior, discussing display, task and organismic variables effects  
A70-38323
- INDUSTRIAL PLANTS**  
Sound level measurements in industrial plants  
[TR-6910.386]  
N70-35320  
Hearing on air pollution in St. Louis area  
N70-35518
- INDUSTRIAL SAFETY**  
Industrial safety harness assessment for aircraft serving personnel  
[FPRC/MEMO-246]  
N70-36510  
Industrial safety hazards of group and individual inorganic acids with control and preventive measures  
N70-36635  
Fundamentals of accident prevention  
N70-37216
- INDUSTRIES**  
Congressional hearings on air pollution control research in motor vehicle, aircraft, and diesel exhausts, and industrial and federal facilities wastes  
N70-36154
- INFARCTION**  
Electrocardiogram vs vectorcardiogram for myocardial infarction diagnosis  
A70-38362  
Hemodynamic effect of lidocaine given by infusion and bolus injections in myocardial infarction, examining cardiac output, heart rate, systolic left ventricular and aortic pressures  
A70-38575  
Antigens immunological response during myocardial infarction  
A70-39151
- INFECTIOUS DISEASES**  
Hypobaric hypoxia effects on MM virus infection resistance in mice  
A70-39428  
Systemic bacterial infection resistance in white mice exposed to simulated hypobaric normoxic space cabin environment  
A70-39431
- INFERENCE**  
Response bias of conservative human inference, using revised odds estimate experiments  
A70-38055
- INFLATABLE STRUCTURES**  
Design of inflatable life raft for aircrafts and boats  
[NASA-CASE-XMS-00863]  
N70-34857  
Inflation tests of liferafts with CO<sub>2</sub> and N<sub>2</sub> at low temperatures  
N70-35262  
Lightweight life preserver without fastening devices  
[NASA-CASE-XMS-00864]  
N70-36493
- INFORMATION SYSTEMS**  
Bibliography on reaction time in human information processing tasks  
[AD-703857]  
N70-35375
- INFORMATION THEORY**  
Applications of decision making, probability theory, and multi-level inference systems to aerospace information processing  
[NASA-CR-112842]  
N70-37468
- INGESTION (BIOLOGY)**  
Mongrel dogs pulmonary and systemic circulatory responses to dopamine infusion  
A70-38986
- INHIBITORS**  
Auxin downward transport by gravity in leaves, examining ethylene inhibition  
A70-39234
- INORGANIC COMPOUNDS**  
Industrial safety hazards of group and individual inorganic acids with control and preventive measures  
N70-36635
- INPUT**  
Real time analog display inputs for electronic computers and tracking in physiological control circuits, describing various manual controls  
A70-37564
- INSTRUMENT APPROACH**  
Pilot scanning dwell times and control workload in simulated instrument approach, using eye-point-of-regard /EPR/ measurements  
[ATAA PAPER 70-999]  
A70-39532
- INSULIN**  
Serum growth hormone response to hypoglycemia in man following insulin administration, reviewing lumped parameter model  
A70-38006
- INTERCRANIAL CIRCULATION**  
Extradural sensor for continuous measurement and recording of human intracranial pressure in neurosurgical practice  
A70-37353
- INTERMITTENCY**  
Geometrical figure fragmentation produced by intermittent illumination, examining dependence on presentation frequency and temporal factors  
A70-39491
- INTERPLANETARY FLIGHT**  
Planetary quarantine flight regulations and information system, microbe release probability, heat sterilization cycles, organic synthesis and contamination factors, Mars landing microbes  
[NASA-CR-112501]  
N70-35042  
Subjects on planetary flight missions, supporting technology, microbial release probabilities, heat sterilization cycles  
N70-35043  
Physiological monitoring system for interplanetary manned space flight  
N70-35985
- INTESTINES**  
Case history of search profiles and selective dissemination of information on intestine material absorption  
[OSTI-5027]  
N70-37047
- INTRAVASCULAR SYSTEM**  
Dynamic intravascular pressures measured in small vessels of frog lung using micropressure transducer inserted into vessel lumen  
A70-38368
- INVERTEBRATES**  
Evolution trends of carbohydrate metabolism in invertebrates

[NASA-TT-F-13190] N70-37490  
**IODINE 131**  
 Transport ratio for I-131 air to milk concentrations, determining mean value and statistical variation from Project Rover data A70-38012  
**ION EXCHANGING**  
 Chloride ion shift of respiration occurring between plasma and erythrocytes as function of carbon dioxide, using rapid filtration method A70-38366  
 Physical characteristics of synthetic and nerve membranes [AD-698816] N70-36431  
**IONIZING RADIATION**  
 Ionizing radiation effects on endocrine system, studying ACTH metabolism in rats under X ray irradiation A70-38723  
**IRON COMPOUNDS**  
 Radiation dosage of Tc 99 iron/II/ complex for brain tumors [LIB/TRANS-237] N70-37581  
**IRON 59**  
 External measurement of Fe-59 ferrokinetics [AD-705046] N70-36467  
**IRRADIATION**  
 Bibliography of irradiated sugar and starch diet effects on mammals, microorganisms and insects [CEA-BIB-178] N70-37139

J

**JUDGMENTS**  
 Interindividual differences in judging stimulus similarities, explaining unsatisfactory results obtained by average scalings A70-38506

K

**KIDNEYS**  
 Prolonged transverse acceleration effects on rats kidney and posterior hypophysis neurosecretions A70-40188  
**KINESTHESIA**  
 Fractional composition of skeletal muscle proteins in white rats during hypokinesia N70-34995  
**KNEE (ANATOMY)**  
 Muscle function mechanics across knee joint in walking, relating tension to length, velocity and energy absorption A70-37810

L

**LANDING SIMULATION**  
 TV display simulation of instrument and visual aircraft landing approaches, investigating color, collimation and resolution effects on pilot evaluations A70-39172  
**LASER OUTPUTS**  
 He-Ne laser beam hazard to human retina A70-38309  
 Protein solutions and cell cultures changes by ruby and Nd lasers radiation, noting threshold energy A70-39419  
 Ruby laser radiation injury relationship to position and number of energy absorbing pigment particles in iris A70-39425  
**LEAKAGE**  
 Ca ion reversible effects of hydrochloric acid and ammonia water on betacyanin leakage from beetroot sections A70-38375  
**LEARNING**  
 Steering behavior during learning as function of self generated stimuli by movement compared with stimulus tracking A70-39674  
**LEARNING MACHINES**  
 Adaptive controller machine based on application of generalized punishments or rewards [AD-703758] N70-35311

Two methods for instructing classifier [AD-700806] N70-36500  
**LEARNING THEORY**  
 Psychological tests for ability to learn association between event and occurrence probability A70-38319  
 Adaptive controller machine based on application of generalized punishments or rewards [AD-703758] N70-35311  
**LEAVES**  
 Auxin downward transport by gravity in leaves, examining ethylene inhibition A70-39234  
 Rhythmic rotational movements in unifoliate leaves of Phaseolus angularis Wight grown under continuous light conditions [NASA-CR-112848] N70-37398  
**LIFE RAFTS**  
 Design of inflatable life raft for aircrafts and boats [NASA-CASE-XMS-00863] N70-34857  
 Inflation tests of liferafts with CO2 and N2 at low temperatures N70-35262  
**LIFE SUPPORT SYSTEMS**  
 Microbiological approach to living conditions for sustained residence and human activity during prolonged space flights, describing sealed chamber experiment A70-37525  
 Hypoxia warning systems using polarographic sensor and miniaturized electronics for face-mask and cabin installation for aircraft and spacecraft A70-39429  
 Portable contingency transfer life support system for crewman of Apollo missions providing oxygen and cooling A70-39441  
 Life support systems based on Chlorella-bacterial culture, investigating water exchange and reclamation A70-40184  
 Human mass exchange parameters permissible errors for manned space vehicles life support systems design A70-40200  
 Shock absorbing couch for body support under high acceleration or deceleration forces [NASA-CASE-XMS-01240] N70-35152  
 Personal portable oxygen respiratory support equipment [NASA-CR-112402] N70-36414  
**LIGHT BEAMS**  
 He-Ne laser beam hazard to human retina A70-38309  
**LIGHT TRANSMISSION**  
 Consequences of tinting in aircraft windshields [AM-MEMO-26] N70-37511  
**LIPIDS**  
 Enzymatic activity in model with lipid membrane separating ribonuclease enzyme from RNA substrate [NASA-TT-F-13185] N70-37471  
**LIQUID CRYSTALS**  
 Cutaneous liquid crystal temperature sensors for thermographic patterns of angina pectoris induced by treadmill exercise A70-38361  
**LIVER**  
 Tyrosine content and utilization in mouse liver, showing daily rhythm in composite metabolism rate A70-38976  
 Liver blood flow in dogs during increased oxygen consumption A70-40448  
 Hepatic subcellular effects of altered atmospheres [AD-705220] N70-36211  
**LOGIC**  
 Attention theory experimental design logic, discussing quantitative theory A70-38315  
 Human memory information structure, discussing pattern recognition, simultaneous attention, problem solving and logic A70-38322  
**LOGICAL ELEMENTS**  
 Component decision logical and temporal

# SUBJECT INDEX

# MEDICAL EQUIPMENT

arrangement in visual search, defining target by several attribute value combination A70-38314

**LOW TEMPERATURE**  
Inflation tests of liferafts with CO2 and N2 at low temperatures N70-35262

**LUMINOUS INTENSITY**  
Prismatic adaptation under scotopic and photopic conditions in subjects, using transfer experiments A70-38052  
Lighting effects on phenylethanolamine-N-methyltransferase /PNMT/ activity and adrenal epinephrine content in rats A70-38982

**LUNAR LANDING**  
Water management during flight of Apollo spacecraft [NASA-TM-X-64445] N70-35803  
Mission training program for Apollo Lunar Landing Mission [NASA-TM-X-65078] N70-35826

**LUNAR MODULE**  
Feasibility of steam turbine for LEM environmental control system [NASA-TM-X-65008] N70-35733  
Crew training program for lunar module thermal vacuum testing [NASA-TM-X-65082] N70-35857

**LUNAR RECEIVING LABORATORY**  
Murine viruses in germfree mice selected for extraterrestrial life testing of Apollo lunar samples [NASA-CR-108589] N70-36473

**LUNG MORPHOLOGY**  
Lung alveolar and capillary wall structure in mammals under normal conditions, transverse acceleration and mechanically changed pulmonary circulation A70-40190

**LYSOGENESIS**  
Lambda prophage induction into lysogens, noting nalidixic acid role in DNA synthesis inhibition A70-39774

**M**

**MAN MACHINE SYSTEMS**  
Soviet book on man in aircraft control system covering engineering psychology, complex flight problems, human factors and instrument panels A70-37236  
Display/control technology for high performance input/output between man and machine, describing man-in-loop simulation A70-37875  
TV display simulation of instrument and visual aircraft landing approaches, investigating color, collimation and resolution effects on pilot evaluations A70-39172  
Complementary capabilities of man and machine for planning and creative problem solving [AD-704810] N70-34841  
Tests and test techniques for human performance prediction in man-machine systems tasks [NASA-CR-1614] N70-35379  
Vestibular and optokinetic stimulation effects on work capacity and reliability of human control operator in flying vehicle N70-36956

**MANNED SPACE FLIGHT**  
Medicobiological approach to living conditions for sustained residence and human activity during prolonged space flights, describing sealed chamber experiment A70-37525  
Microwave feeding system for heating and cooking prepackaged meals during extended space missions A70-37747  
Astronaut weight loss relation to flight duration during manned space missions A70-40125  
Medical support for long space missions based on space crews morbidity prediction, discussing onboard equipment and astronaut training A70-40194

Biomedical foundations of manned space flight [AD-703316] N70-35340  
Physiological measurements and onboard computer processing for biotelemetric control of manned space flight [JPRS-50977] N70-35982  
Design of automated physiological measuring and biotelemetry system for manned spaceship N70-35983  
Physiological monitoring system for interplanetary manned space flight N70-35985

**MANNED SPACECRAFT**  
Human mass exchange parameters permissible errors for manned space vehicles life support systems design A70-40200

**MANUAL CONTROL**  
Test program for determining visual reference requirements for pilot control of gliding parachutes used in landing spacecraft on land [NASA-TM-X-64430] N70-35696

**MAPPING**  
Isopotential surface maps for body surface potential relation to ECG and Frank vectorcardiogram during QRS stages in children A70-39368

**MARKERS**  
Performance of Apollo sea dye marking powder [NASA-TM-X-65045] N70-35724

**MARS LANDING**  
Estimation of microbial release probabilities from Martian lander N70-35044

**MASS SPECTROSCOPY**  
Exhaled alveolar air data acquisition using mass spectrometer and multichannel analyzer A70-37356

**MASS TRANSFER**  
Human mass exchange parameters permissible errors for manned space vehicles life support systems design A70-40200  
Simulation test data for storage box transfer through airlock module [NASA-TM-X-53887] N70-35915

**MATHEMATICAL MODELS**  
Mathematical representation of heart muscle mechanical properties, examining tensile stress in parallel and series elements A70-37809  
Neuron reticulum model for visual information processing [JPRS-51142] N70-36036  
Adaptive mathematical model development for deriving automated pilot performance measurement techniques [AD-704597] N70-36244  
Nonlinear analysis of pressure waves and shock waves in blood vessels [NASA-CR-112864] N70-36857

**MATRICES (MATHEMATICS)**  
Mathematical methods for improving sharpness of scintigraphic images [CEA-R-3920] N70-37137

**MEASURING INSTRUMENTS**  
External measurement of Fe-59 ferrokinetics [AD-705046] N70-36467

**MECHANICAL PROPERTIES**  
Mathematical representation of heart muscle mechanical properties, examining tensile stress in parallel and series elements A70-37809  
Variations in mechanical properties of canine abdominal vena cava [NASA-CR-112876] N70-37029

**MEDICAL ELECTRONICS**  
Cardiovascular stress testing using posterior bipolar lead for radiotelemetry monitoring A70-39199  
Medical monitoring system onboard Soyuz spacecraft, describing equipment design, data acquisition and analysis, telemetric recordings, etc A70-40193

**MEDICAL EQUIPMENT**  
Portable battery operated system for rapid measurements of blood plasma electrolytes during aeromedical evacuation

## MEMBRANES

- Multiple choice rotation chair for clinical experimental research and pilot vestibular tests  
A70-39433
- Air transportation of respiratory failure patients, considering medical equipment adaptation for aircraft use  
A70-39438
- Mathematical methods for improving sharpness of scintigraphic images  
[CEA-R-3920]  
N70-37137
- MEMBRANES**
- Physical characteristics of synthetic and nerve membranes  
[AD-698816]  
N70-36431
- Enzymatic activity in model with lipid membrane separating ribonuclease enzyme from RNA substrate  
[NASA-TT-F-13185]  
N70-37471
- MEMORY**
- Human memory information structure, discussing pattern recognition, simultaneous attention, problem solving and logic  
A70-38322
- MENTAL PERFORMANCE**
- Decreased mental and physical performance of human beings due to T-oral and placebo vaccine reactions  
A70-37389
- Soviet monograph on secondary signaling system role in development of speech, thought, conditioned and unconditioned reflexes, human will and hypnosis, noting salivary gland function  
A70-37407
- Psychological tests for ability to learn association between event and occurrence probability  
A70-38319
- MERCURY (METAL)**
- Bibliography of literature on environmental contamination by mercury  
N70-37333
- METABOLIC WASTES**
- Reduced atmospheric pressure effect on human elimination of gaseous and volatile metabolites in pressurized suits  
N70-35001
- Mineral and water metabolism in humans after exposure to transverse acceleration  
N70-35002
- METABOLISM**
- Low ambient temperature exposure effect on hamster intestinal absorption capacity, using glucose test compound  
A70-37772
- Tyrosine content and utilization in mouse liver, showing daily rhythm in composite metabolism rate  
A70-38976
- Atmospheric composition cyclic changes effects on human basal metabolism under hypokinesia  
A70-40197
- Effect of 3-methylisoxazole-5-carbonic acid on metabolism and thermoregulation of mice exposed to cold  
[NASA-TT-F-13158]  
N70-36110
- Endogenous metabolism and survival of non-spore forming anaerobic bacteria under starving conditions  
[AD-703930]  
N70-36272
- METHYL COMPOUNDS**
- 3-O-methyl-mannose neutral sugar identification as constituent of fungal polysaccharide  
A70-39625
- Effect of 3-methylisoxazole-5-carbonic acid on metabolism and thermoregulation of mice exposed to cold  
[NASA-TT-F-13158]  
N70-36110
- MICE**
- Tyrosine content and utilization in mouse liver, showing daily rhythm in composite metabolism rate  
A70-38976
- Effect of 3-methylisoxazole-5-carbonic acid on metabolism and thermoregulation of mice exposed to cold  
[NASA-TT-F-13158]  
N70-36110

## SUBJECT INDEX

- Murine viruses in germfree mice selected for extraterrestrial life testing of Apollo lunar samples  
[NASA-CR-108589]  
N70-36473
- MICROBALANCES**
- Uncoated quartz twin crystal microbalance for monitoring water vapor content of respiratory gases  
A70-37844
- MICROMINIATURIZATION**
- Multipurpose microminiature multichannel biomedical telemetry system, discussing design  
A70-37856
- MICROORGANISMS**
- Circadian rhythms in single cell animals, examining cell division, temperature and light effects  
A70-38410
- Planetary quarantine flight regulations and information system, microbe release probability, heat sterilization cycles, organic synthesis and contamination factors, Mars landing microbes  
[NASA-CR-112501]  
N70-35042
- Subjects on planetary flight missions, supporting technology, microbial release probabilities, heat sterilization cycles  
N70-35043
- Estimation of microbial release probabilities from Martian lander  
N70-35044
- Microorganism transport through small orifices in bio-barrier fluid flow  
[NASA-CR-66703]  
N70-35877
- Chemical reduction capacity of various microflora found in silt and soil deposits from different biochemical regions  
[NASA-TT-F-13197]  
N70-36013
- Bacteriological research in high atmospheric layers for microorganisms  
[AD-703889]  
N70-36232
- Cytochemical studies of planetary microorganisms and explorations in exobiology  
[NASA-CR-112847]  
N70-37403
- Abiogenesis and effect of ultraviolet radiation on one-celled organisms  
[NASA-TT-F-13188]  
N70-37502
- MICROWAVE EQUIPMENT**
- Microwave feeding system for heating and cooking prepackaged meals during extended space missions  
A70-37747
- MICROWAVES**
- Microwave radiation effects on maintenance personnel, investigating respiratory reaction, attention concentration, blood content of K, Ca, Na and proteins, etc  
A70-40289
- MILITARY AIRCRAFT**
- Geographic orientation in air operations for military aircraft systems  
[AD-705021]  
N70-36457
- MILITARY VEHICLES**
- Laboratory and field studies for data acquisition on tank crews during combat operations  
[AD-705705]  
N70-36449
- MILK**
- Transport ratio for I-131 air to milk concentrations, determining mean value and statistical variation from Project Rover data  
A70-38012
- MISSION PLANNING**
- Philosophy and technology of unmanned spacecraft sterilization and planetary quarantine  
[NASA-TM-X-53884]  
N70-37461
- MITOCHONDRIA**
- Senescent Drosophila melanogaster flight muscle electron microscopic examination showing mitochondria in stages of degeneration  
A70-40075
- MITOSIS**
- Role of mediators in individual development and changes in their functions during evolution  
[NASA-TT-F-13191]  
N70-37559
- MOISTURE CONTENT**
- Uncoated quartz twin crystal microbalance for monitoring water vapor content of respiratory gases  
A70-37844
- MOLLUSKS**
- Evolution of cholinergic mediatory process in

- mollusks  
[NASA-TT-F-13192] N70-36132
- MONITORS**  
Medical monitoring system onboard Soyuz spacecraft, describing equipment design, data acquisition and analysis, telemetric recordings, etc A70-40193
- MONKEYS**  
Macaca nemestrina total body water measurement by dilution technique A70-40333
- MORPHOLOGY**  
Morphological changes in bone and muscle tissue during hypokinesia N70-35005
- MOTION SICKNESS**  
Soviet book on peripheral vestibular apparatus and higher nervous system roles in motion sickness covering Coriolis acceleration tests, pilot training and selection, drugs, etc A70-37406
- MOTION SICKNESS DRUGS**  
Antimotion sickness drugs evaluated for effectiveness under standardized stress conditions in slow rotation room A70-39439
- MOUNTAIN INHABITANTS**  
Hemodynamic changes in Andean native after two years at sea level, measuring intravascular pressures, cardiac output, heart rate and stroke index A70-39427
- MULTICHANNEL COMMUNICATION**  
Multipurpose microminiature multichannel biomedical telemetry system, discussing design A70-37856
- MULTIPLE DOCKING ADAPTERS**  
Simulation test report for multiple docking adapter external handrail system evaluation [NASA-TM-X-53894] N70-37533  
Methods and procedures for evaluating internal mobility aids in multiple docking adapters [NASA-TM-X-53895] N70-37583
- MUSCLES**  
Analog computer for continuous recording of oxygen consumption of muscular area in canine foot via blood flow rate and oxygen saturation A70-37354  
Senescent Drosophila melanogaster flight muscle electron microscopic examination showing mitochondria in stages of degeneration A70-40075  
Morphological changes in bone and muscle tissue during hypokinesia N70-35005
- MUSCULAR FUNCTION**  
Diaphragmatic muscle reactions and pneumogram changes in rats immediately after air passage obstruction A70-37804  
Myocardial contractile function in rats under acute overstrain, evaluating role of preliminary training to altitude hypoxia A70-37805  
Muscle function mechanics across knee joint in walking, relating tension to length, velocity and energy absorption A70-37810  
Perfusion peristaltic pump for determining smooth muscle reaction in vascular bed, discussing applications to physiological and pharmacological investigations A70-38958
- MUSCULAR STRENGTH**  
Fractional composition of skeletal muscle proteins in white rats during hypokinesia N70-34995
- MUSCULAR TONUS**  
Muscular mechanics of intact heart contraction, discussing effects of altered fiber length, afterload and inotropic state A70-39363
- MUSCULOSKELETAL SYSTEM**  
Macroscopic architectural changes of cancellous and cortical bone in Rhesus monkey following long term immobilization and chemical removal of calcium A70-38983
- Plasma tocopherol concentrations and vitamin E deficiency in dogs, noting pathologic changes in smooth muscle, central nervous system, skeletal muscle and retina A70-38991
- Visceral blood flow during exercise in sled dogs, testing hypothetical compensatory decrease as cardiovascular reserve for skeletal muscle by biotelemetry A70-39366
- Ulnar resonant frequency reproducibility as objective measure of skeletal status, discussing forearm and hand positioning effect A70-39432
- Skeletal muscles static tension influence on dog respiratory center functional properties, showing increased frequency volume and sensitivity under stimulation A70-40174
- MYOCARDIUM**  
Myocardial contractile function in rats under acute overstrain, evaluating role of preliminary training to altitude hypoxia A70-37805  
Mathematical representation of heart muscle mechanical properties, examining tensile stress in parallel and series elements A70-37809  
Intracellular myocardium potentials under vagus inhibition by electrometric DC amplifiers with positive and negative feedback A70-38213  
Electrocardiogram vs vectorcardiogram for myocardial infarction diagnosis A70-38362  
Hemodynamic effect of lidocaine given by infusion and bolus injections in myocardial infarction, examining cardiac output, heart rate, systolic left ventricular and aortic pressures A70-38575  
Antigens immunological response during myocardial infarction A70-39151  
Mechanical analysis involving clamping apparatus for cardiac muscle contractile response A70-39362  
Muscular mechanics of intact heart contraction, discussing effects of altered fiber length, afterload and inotropic state A70-39363  
Determinants of human ventricular dimensions and myocardial free velocity relations during maximum and submaximum exercise levels A70-39365  
Myocardial Na and K content of rats exposed to high altitude, preparing isolated right ventricular strip A70-40541  
Heart pathology and myocardial infarction research, including data management and animal studies [PB-190112] N70-37576
- MYOPIA**  
Hypoxia effects on aviators visual accommodation, convergence and stereoacuity, noting myopia increase with altitude A70-38996
- N**
- NERVES**  
Physical characteristics of synthetic and nerve membranes [AD-698816] N70-36431
- NERVOUS SYSTEM**  
Soviet book on peripheral vestibular apparatus and higher nervous system roles in motion sickness covering Coriolis acceleration tests, pilot training and selection, drugs, etc A70-37406  
Stress effects on human nervous system and physiological responses [JPRS-51067] N70-37063  
Role of mediators in individual development and changes in their functions during evolution [NASA-TT-F-13191] N70-37559
- NEURAL NETS**  
Brightness contrast by human observer binocular matching, discussing neural networks models



## NEURONS

Adaptive controller machine based on application  
of generalized punishments or rewards  
[AD-703758] A70-38924 N70-35311

NEURONS  
Extracellular spontaneous sequences of action  
potentials of thalamic neurons during asphyxia  
in rats under artificial respiration A70-38306

Acetylcholinesterase and simple esterases  
distribution in squirrel monkey brain, examining  
activity in neuropil and postrema area neurons A70-38993

Rat neuron impulsive reactions and frequency  
response differences to varying sound signals,  
discussing time constant, signal intensity and  
frequencies A70-40172

Carbon dioxide tension in arterial blood effects  
on rhythmic volley activity of respiratory  
neurons in medulla oblongata N70-34993

Neuron reticulum model for visual information  
processing [JPRS-51142] N70-36036

NEUROPHYSIOLOGY  
Enhanced evoked potentials sited by auditory  
stimuli in complex task, considering EEG and  
neurophysiological basis of selective attention A70-38318

Prolonged transverse acceleration effects on rats  
kidney and posterior hypophysis neurosecretions A70-40188

NEUROSPORA  
Genetic effects of radiation dosage on Neurospora  
during Gemini 11 and biosatellite 2 missions  
[NASA-CR-112354] N70-36826

NEUTRON IRRADIATION  
Quantitative analysis of rare earth elements in  
plants using thermal neutron irradiation and  
chromatography [CEA-R-3917] N70-37015

NEUTRON THERMALIZATION  
Computer programs for fast neutron thermalization,  
thermal neutron scattering, and gamma radiation  
damage [CEA-R-3994] N70-37113

NEW JERSEY  
Air quality control standards for New Jersey, New  
York, and Connecticut [PB-191389] N70-37519

NEW YORK  
Air quality control standards for New Jersey, New  
York, and Connecticut [PB-191389] N70-37519

NITROGEN  
Inflation tests of liferafts with CO<sub>2</sub> and N<sub>2</sub> at  
low temperatures N70-35262

NITROGEN FLUORIDES  
Nitrogen trifluoride effects on rat cardiovascular  
system [AD-705045] N70-36468

NOISE (SOUND)  
Noise effects on arousal level in auditory  
vigilance from EEG parameters A70-38325

NOISE INJURIES  
Ship engineers cardiovascular system functional  
changes during HF internal combustion engine  
noise, investigating EKG recordings and arterial  
pressure A70-40292

NOISE INTENSITY  
Temporal and spectra combination effects on  
aircraft sound judged noisiness, using human  
subjects in anechoic chamber A70-39712

Sound level measurements in industrial plants  
[TR-6910.386] N70-35320

Stress effects of high noise levels on lower body  
negative pressure experiments [NASA-TN-D-5967] N70-37076

NOISE SPECTRA  
Sound level vs duration evaluated for noise  
exposure using different exchange rates  
[ASA PAPER PF2] A70-39125

Temporal and spectra combination effects on  
aircraft sound judged noisiness, using human

## SUBJECT INDEX

subjects in anechoic chamber A70-39712

NONLINEAR SYSTEMS  
Nonlinear regression analysis of biomedical data  
by time-sharing computers [AD-704858] N70-36541

NUCLEAR REACTORS  
Physical and chemical characteristics and possible  
hazards from particulate matter released from  
Phoebus 1B - EP 4 reactor [SWRHL-46-R] N70-37340

NUTRITIONAL REQUIREMENTS  
Sterilization and storage effects on nutritional  
value of canned foods [R-3092] N70-35577

Endogenous metabolism and survival of non-spore  
forming anaerobic bacteria under starving  
conditions [AD-703930] N70-36272

NYSTAGMUS  
Vestibular thermal stimulation method using  
distilled water injected into ear, discussing  
nystagmus appearance and duration A70-37355

OCEAN BOTTOM  
Benthic biomass and animal densities under varying  
ecological conditions [NYO-3862-24] N70-35107

ONBOARD EQUIPMENT  
Medical monitoring system onboard Soyuz  
spacecraft, describing equipment design, data  
acquisition and analysis, telemetric recordings,  
etc A70-40193

Medical support for long space missions based on  
space crews morbidity prediction, discussing  
onboard equipment and astronaut training A70-40194

OPERATOR PERFORMANCE  
Radar consoles with various display components  
under different illumination levels to determine  
optimal operator performance, discussing push-  
button design recommendations A70-39713

Tests and test techniques for human performance  
prediction in man-machine systems tasks [NASA-CR-1614] N70-35379

Vestibular and optokinetic stimulation effects on  
work capacity and reliability of human control  
operator in flying vehicle N70-36956

OPTIMIZATION  
Optimum attention allocation, discussing  
distraction resistance and multiple task  
performance A70-38316

ORGANIC PHOSPHORUS COMPOUNDS  
Carbon dioxide content of dialyzed human  
hemoglobin measured at specific pressure and  
varying pH values as function of 2,3  
diphosphoglycerate A70-38367

ORGANIC SULFUR COMPOUNDS  
Stability of new compounds derived from uracil and  
thiouracil after gamma ray irradiation [CEA-R-3962] N70-37080

ORTHOSTATIC TOLERANCE  
Orthostatic tolerance increase in animals by  
application of hyperoxic and hypercapnic gas  
mixtures A70-40185

OSCILLATORS  
Axiomatic approach to homeostasis, discussing  
living systems as oscillators with input-output  
and transit variables in duration and elongation A70-38411

OTOLITH ORGANS  
Otolithic weight changes and vestibular disorders  
during weightlessness N70-35003

OXIDIZERS  
Anomalous substrate oxidizing specificities among  
red brown and green algal peroxidases and land  
plants A70-37773

## SUBJECT INDEX

## PHONOCARDIOGRAPHY

## OXYGEN

Hepatic subcellular effects of altered atmospheres  
[AD-705220] N70-36211

## OXYGEN BREATHING

Prolonged hyperbaric oxygen breathing effect on  
human physical performance at rest and during  
severe exercise A70-38369

## OXYGEN CONSUMPTION

Analog computer for continuous recording of oxygen  
consumption of muscular area in canine foot via  
blood flow rate and oxygen saturation A70-37354

Psychotropic drugs radioprotective effects in mice,  
noting oxygen consumption and body temperature  
decrease after X ray exposure A70-37558

Coulometric microrespirometer for long term  
numerical recording of oxygen consumption in  
respiratory chamber under sterile conditions A70-38372

Oxygen pressure effects on tracking control  
training for stable reactions, investigating  
muscles bioelectrical activity changes during  
elevated pressure breathing A70-40291

Oxygen uptake at alveolar capillary membrane,  
investigating ventilation variability at  
exercise onset A70-40331

Liver blood flow in dogs during increased oxygen  
consumption A70-40448

Manned testing of flight breadboard oxygen system  
[NASA-CR-73395] N70-36933

## OXYGEN MASKS

Breathing mask for Apollo command module spacecrew  
[NASA-TM-X-64441] N70-35728

## OXYGEN PRODUCTION

Unicellular hot spring acidophilic alga Cyanidium  
cadarium cultured in pure carbon dioxide,  
examining packed cell volume, oxygen production  
and growth rate A70-39492

## OXYGEN SUPPLY EQUIPMENT

Portable contingency transfer life support system  
for crewman of Apollo missions providing oxygen  
and cooling A70-39441

Personal portable oxygen respiratory support  
equipment [NASA-CR-112402] N70-36414

Manned testing of flight breadboard oxygen system  
[NASA-CR-73395] N70-36933

## P

## PALEONTOLOGY

Applying paleontological method of studying  
sedimentary deposits to investigation of  
earliest forms of life in northern Eurasia  
[NASA-TT-P-13189] N70-37473

## PARAGLIDERS

Test program for determining visual reference  
requirements for pilot control of gliding  
parachutes used in landing spacecraft on land  
[NASA-TM-X-64430] N70-35696

## PARTICLE DENSITY (CONCENTRATION)

Physical and chemical characteristics and possible  
hazards from particulate matter released from  
Phoebus 1B - EP 4 reactor [SWRHL-46-R] N70-37340

## PARTICLE SIZE DISTRIBUTION

Dispersion pattern of aerosol particles in free  
atmosphere [AD-702332] N70-35421

## PATHOGENESIS

Frequency and origin of somatic and genetic  
radiation damage for external irradiation or  
after incorporation of radionuclides  
[EUR-4405-D] N70-36291

## PATHOLOGICAL EFFECTS

Plasma tocopherol concentrations and vitamin E  
deficiency in dogs, noting pathologic changes in  
smooth muscle, central nervous system, skeletal  
muscle and retina A70-38991

## PATHOLOGY

Pathophysiology of congenital heart disease -

Conference, University of California, Los  
Angeles, July 1967 A70-39361

Heart pathology and myocardial infarction  
research, including data management and animal  
studies [PB-190112] N70-37576

## PATIENTS

Air transportation of respiratory failure  
patients, considering medical equipment  
adaptation for aircraft use A70-39440

## PATTERN RECOGNITION

Eye movements during visual search and meaningless  
pattern discrimination A70-38054

Human memory information structure, discussing  
pattern recognition, simultaneous attention,  
problem solving and logic A70-38322

Preliminary conversion of images in visual imaging  
identification system [AD-703380] N70-35362

Statistical characteristics of images indicating  
forms [AD-700581] N70-36396

Two methods for instructing classifier  
[AD-700806] N70-36500

## PERFORMANCE PREDICTION

Tests and test techniques for human performance  
prediction in man-machine systems tasks  
[NASA-CR-1614] N70-35379

## PERFORMANCE TESTS

Choice reaction and movement time dependence on  
hypoxia induced by air pressure reduction inside  
decompression chamber, discussing adult human  
performance A70-39714

Performance of Apollo sea dye marking powder  
[NASA-TM-X-65045] N70-35724

## PERIPHERAL CIRCULATION

Peripheral vasculocapillary blood circulation by  
television UV capillaroscopy and electronic  
finger plethysmography A70-38212

Human peripheral blood flow rewarming in cold  
ambient temperature, examining skin, rectal and  
tympanic membrane and oxygen uptake A70-40327

## PERITONEUM

Treating radioactive contamination of human  
organism by using tritiated water  
[CEA-R-3974] N70-37111

## PERSONALITY TESTS

Aptitude test validity taking into account  
selection board subjective decisions on pilot  
applicant acceptance A70-38507

Personality correlates of centering of self in  
phenomenal field [AD-705065] N70-36551

## PERSONNEL

Fundamentals of accident prevention N70-37216

## PERSONNEL DEVELOPMENT

ATC personnel training at International ATC  
Academy, discussing objectives and syllabus A70-38650

## PERSONNEL MANAGEMENT

Air traffic controller stress reduction,  
discussing work-rest intervals and various  
management and human factors A70-38647

## PERSONNEL SELECTION

Literature search with abstracts on visual  
performance standards for selection and  
retention of astronauts [NASA-CR-108587] N70-36362

## PHASE COHERENCE

Alpha rhythm phase coherence during photic  
blocking, examining pacemaker model A70-37811

## PHENOMENOLOGY

Choice prediction in partially repeatable decision  
situations, discussing phenomenological analysis A70-38504

## PHONOCARDIOGRAPHY

Ultrasonic nonsearch Doppler cardiography for  
cycle phase analysis, recording single functions

## PHOTICS

## SUBJECT INDEX

PHOTICS A70-40199  
 Alpha rhythm phase coherence during photic blocking, examining pacemaker model A70-37811

PHOTOSENSITIVITY  
 Circadian rhythms in single cell animals, examining cell division, temperature and light effects A70-38410  
 Photoperiodism in animal organism, discussing retinal epithelium photosensitive substance accumulation and retino-hypothalamo-hypophyseal mechanism of pigmentation A70-38413  
 Rhythmic rotational movements in unifoliate leaves of Phaseolus angularis Wight grown under continuous light conditions [NASA-CR-112848] N70-37398

PHOTOSYNTHESIS  
 Hydrostatic pressure effects on photosynthesis and growth of unicellular marine algae and diatoms [AD-704496] N70-36546

PHYSICAL EXAMINATIONS  
 Soviet monograph on automated physiological measurements with onboard computers, covering EKG, EEG, electromyogram, respiration, muscular activity, etc A70-38797  
 Multiple choice rotation chair for clinical experimental research and pilot vestibular tests A70-39438  
 Astronauts medical examination, using thermal load as functional and diagnostic test A70-40195

PHYSICAL EXERCISE  
 Cutaneous liquid crystal temperature sensors for thermographic patterns of angina pectoris induced by treadmill exercise A70-38361  
 Prolonged hyperbaric oxygen breathing effect on human physical performance at rest and during severe exercise A70-38369  
 Human body core temperature control dependence during exercise on heat dissipation, noting sweating control A70-38997  
 Determinants of human ventricular dimensions and myocardial free velocity relations during maximum and submaximum exercise levels A70-39365  
 Visceral blood flow during exercise in sled dogs, testing hypothetical compensatory decrease as cardiovascular reserve for skeletal muscle by biotelemetry A70-39366  
 Preliminary physical training for human water immersion resistance improvement A70-40196

PHYSICAL PROPERTIES  
 Physical and chemical characteristics and possible hazards from particulate matter released from Phoebus 1B - EP 4 reactor [SWRHL-46-R] N70-37340

PHYSICAL WORK  
 Decreased mental and physical performance of human beings due to T-oral and placebo vaccine reactions A70-37389  
 Psychological effects of assigning unexpected tasks to operator in simulated space flight environment N70-35000

PHYSIOLOGICAL EFFECTS  
 Microwave radiation effects on maintenance personnel, investigating respiratory reaction, attention concentration, blood content of K, Ca, Na and proteins, etc A70-40289  
 Ship engineers cardiovascular system functional changes during HP internal combustion engine noise, investigating EKG recordings and arterial pressure A70-40292  
 Physiological correlates of vigilance performance in humans [AD-706054] N70-34976

Vestibular and optokinetic stimulation effects on work capacity and reliability of human control operator in flying vehicle N70-36956  
 Stress effects of high noise levels on lower body negative pressure experiments [NASA-TN-D-5967] N70-37076  
 Rhythmic rotational movements in unifoliate leaves of Phaseolus angularis Wight grown under continuous light conditions [NASA-CR-112848] N70-37398

PHYSIOLOGICAL FACTORS  
 Electronic differentiator for physiological research, discussing electrical voltage derivatives reproduction, sensitivity, etc A70-38219  
 Human vigilance paradigm and physiology, discussing relationships between vigilance, signal detection and animal discrimination A70-38324

PHYSIOLOGICAL RESPONSES  
 Low ambient temperature exposure effect on hamster intestinal absorption capacity, using glucose test compound A70-37772  
 Human spatio-temporal visual evoked response characteristics, showing potential gradient rotation in same period as input stimulus A70-37845  
 Human brain LF activity in visual evoked response, determining relationship to stimulation A70-37846  
 Human response time to visual stimulus preceding or following auditory stimulus as function of interstimulus interval A70-38311  
 Prolonged hyperbaric oxygen breathing effect on human physical performance at rest and during severe exercise A70-38369  
 Mongrel dogs pulmonary and systemic circulatory responses to dopamine infusion A70-38986  
 Determinants of human ventricular dimensions and myocardial free velocity relations during maximum and submaximum exercise levels A70-39365  
 Skeletal muscles static tension influence on dog respiratory center functional properties, showing increased frequency volume and sensitivity under stimulation A70-40174  
 Athletes ventilation and heart rate dynamic responses to supine leg exercise with sinusoidal work load A70-40329  
 Physiological responses of Soyuz 6, 7, and 8 astronauts N70-34999  
 High temperature effects on performance of complex tasks by senior pilots [AD-703632] N70-35090  
 Stress effects on human nervous system and physiological responses [JPRS-51067] N70-37063  
 Electrophysiological parameter changes after disturbance of motor conditioned reaction rhythm in man N70-37064  
 Rheoencephalographic changes as indication of psychic stress N70-37065

PHYSIOLOGICAL TESTS  
 Soviet monograph on automated physiological measurements with onboard computers, covering EKG, EEG, electromyogram, respiration, muscular activity, etc A70-38797  
 Circadian rhythms from electrocardiogram and cardiograph of patient with human heart transplant, noting P waves relationship between donor and recipient tissues A70-39166  
 Reduced atmospheric pressure effect on human elimination of gaseous and volatile metabolites in pressurized suits N70-35001  
 Physiological measurements and onboard computer processing for biotelemetric control of manned

## SUBJECT INDEX

## PRESSURE EFFECTS

- space flight  
[JPRS-50977] N70-35982  
Design of automated physiological measuring and  
biotelemetry system for manned spaceship N70-35983  
Physiological measurements and algorithms for data  
processing in biological telemetry N70-35984  
Cerebral and symmetric vascular dynamics in  
response to stress N70-36397  
[AD-701941]  
**PHYSIOLOGY**  
Soviet papers on physiological data collection and  
analysis methods A70-38206  
**PIGMENTS**  
Photoperiodism in animal organism, discussing  
retinal epithelium photosensitive substance  
accumulation and retino-hypothalamo-hypophyseal  
mechanism of pigmentation A70-38413  
Ruby laser radiation injury relationship to  
position and number of energy absorbing pigment  
particles in iris A70-39425  
**PILOT PERFORMANCE**  
Computer simulated decision hierarchical model of  
helicopter and VTOL pilot for multiloop closure  
and tracking characteristics of man-vehicle  
system A70-38921  
Comfort plane switch mounting design for  
helicopter collective controls, noting mock-up  
evaluation by test pilots A70-38922  
Hypoxia effects on aviators visual accommodation,  
convergence and stereocuity, noting myopia  
increase with altitude A70-38996  
Pilot scanning dwell times and control workload in  
simulated instrument approach, using  
eye-point-of-regard/EPR/ measurements  
[AIAA PAPER 70-999] A70-39532  
Criteria for rating proficient performance of  
complex job in aviation combat situation  
[AD-703510] N70-34944  
High temperature effects on performance of complex  
tasks by senior pilots N70-35090  
[AD-703632]  
Adaptive mathematical model development for  
deriving automated pilot performance measurement  
techniques N70-36244  
[AD-704597]  
Operational profile and mission of certified  
non-instrument rated commercial pilot  
[FAA-RD-70-50] N70-36936  
Consequences of tinting in aircraft windshields  
[AM-MEMO-26] N70-37511  
**PILOT SELECTION**  
Aptitude test validity taking into account  
selection board subjective decisions on pilot  
applicant acceptance A70-38507  
**PILOT TRAINING**  
Soviet book on peripheral vestibular apparatus and  
higher nervous system roles in motion sickness  
covering Coriolis acceleration tests, pilot  
training and selection, drugs, etc A70-37406  
Evaluation of integrated contact-instrument  
concept for Army fixed wing flight instruction  
[AD-703161] N70-36454  
**PILOTS (PERSONNEL)**  
Chart and printed material legibility in cockpits  
for pilots N70-36861  
[AM-MEMO-27]  
**PITUITARY GLAND**  
Mathematical model of human pituitary gland  
mechanism controlling secretions of serum growth  
hormone in response to glucose deficiency A70-38995  
**PITUITARY HORMONES**  
Human gluco-regulatory hormone reserve depressions  
following acute and chronic acceleration  
exposure A70-39436  
Changing gravity and weightlessness effects on  
vasopressin control systems, with immunochemical  
and biological assay studies
- [NASA-CR-112358] N70-36764  
**PLANETARY QUARANTINE**  
Planetary quarantine flight regulations and  
information system, microbe release probability,  
heat sterilization cycles, organic synthesis and  
contamination factors, Mars landing microbes  
[NASA-CR-112501] N70-35042  
Subjects on planetary flight missions, supporting  
technology, microbial release probabilities,  
heat sterilization cycles N70-35043  
Research and developments in planetary quarantine  
program N70-35931  
[NASA-CR-110046]  
Philosophy and technology of unmanned spacecraft  
sterilization and planetary quarantine  
[NASA-TM-X-53884] N70-37461  
**PLANT ROOTS**  
Ca ion reversible effects of hydrochloric acid and  
ammonia water on betacyanin leakage from  
beetroot sections A70-38375  
Mechanisms controlling orientation of side roots  
and other plagiotropic plant parts in geotropic  
critical angle N70-36014  
[NASA-TT-F-12639]  
**PLANTS (BOTANY)**  
Anomalous substrate oxidizing specificities among  
red brown and green algal peroxidases and land  
plants A70-37773  
Geochemical ecology of plants N70-36133  
[NASA-TT-F-13198]  
Quantitative analysis of rare earth elements in  
plants using thermal neutron irradiation and  
chromatography N70-37015  
[CEA-R-3917]  
**PNEUMOGRAPHY**  
Diaphragmatic muscle reactions and pneumogram  
changes in rats immediately after air passage  
obstruction A70-37804  
**POLAR REGIONS**  
Darkness adaptation of flight personnel in polar  
regions, discussing effects of physical and  
nervous strain, sickness and alcoholic  
intoxication A70-40290  
**POLYMERS**  
Toxicity problems from burning or heating of  
polymeric materials, discussing laboratory  
experiments and standardized toxicity testing  
procedures A70-39406  
**POPULATIONS**  
Air pollution threat in Sacramento, California,  
projected population, vehicles, and activities  
[PB-191382] N70-37433  
**PORTABLE EQUIPMENT**  
Portable battery operated system for rapid  
measurements of blood plasma electrolytes during  
aeromedical evacuation A70-39433  
Portable dry ice, water conditioned suit system  
[AD-700915] N70-36364  
Personal portable oxygen respiratory support  
equipment N70-36414  
[NASA-CR-112402]  
**PRECAMBRIAN PERIOD**  
Applying paleontological method of studying  
sedimentary deposits to investigation of  
earliest forms of life in northern Eurasia  
[NASA-TT-F-13189] N70-37473  
**PREDICTIONS**  
Choice prediction in partially repeatable decision  
situations, discussing phenomenological analysis  
A70-38504  
**PRESERVING**  
Improved acceptability of feeding system of  
reversibly compressed, dehydrated food bars and  
cubes of sauces and seasonings N70-36775  
[NASA-CR-112676]  
**PRESSURE CHAMBERS**  
Human respiration activity measurement in pressure  
chamber with different pressures and mixture  
compositions by spiograph equipment A70-40175  
**PRESSURE EFFECTS**  
Sinusoidal vibrations effects on rats at different

## PRESSURE MEASUREMENTS

- air pressures, discussing human vibration tolerances and resonant frequencies of thoraco-abdominal system A70-39434
- Choice reaction and movement time dependence on hypoxia induced by air pressure reduction inside decompression chamber, discussing adult human performance A70-39714
- Oxygen pressure effects on tracking control training for stable reactions, investigating muscles bioelectrical activity changes during elevated pressure breathing A70-40291
- Ambient near vacuum pressure effect on blood circulation, examining thoracic aorta blood flow, pressures, gas expansion and water vaporization A70-40326
- Hydrostatic pressure effects on photosynthesis and growth of unicellular marine algae and diatoms [AD-704496] N70-36546
- PRESSURE MEASUREMENTS**
- Arterial pressure measurement by automatic control system based on external compression pressure for maximum amplitude intraarterial pressure pulse oscillations A70-38215
- Dynamic intravascular pressures measured in small vessels of frog lung using micropressure transducer inserted into vessel lumen A70-38368
- Reliability tests of blood carbon dioxide pressure measurement methods, indicating carbon dioxide-electrode method superiority A70-38371
- Radio telemetry measurements of blood pressure and flow in unrestrained animals A70-39370
- PRESSURE SENSORS**
- Extradural sensor for continuous measurement and recording of human intracranial pressure in neurosurgical practice A70-37353
- PRESSURE SUITS**
- Reduced atmospheric pressure effect on human elimination of gaseous and volatile metabolites in pressurized suits N70-35001
- PRESSURIZED CABINS**
- Effect of cabin pressure on environmental control system [NASA-TN-X-65009] N70-35804
- PRIMATES**
- Anthropometric determinations of American born Macaca mulatta for orbiting primate experiment [AD-700907] N70-36495
- PRISMS**
- Prismatic adaptation under scotopic and photopic conditions in subjects, using transfer experiments A70-38052
- PROBABILITY THEORY**
- Psychological tests for ability to learn association between event and occurrence probability A70-38319
- Applications of decision making, probability theory, and multi-level inference systems to aerospace information processing [NASA-CR-112842] N70-37468
- PROBLEM SOLVING**
- Human memory information structure, discussing pattern recognition, simultaneous attention, problem solving and logic A70-38322
- Complementary capabilities of man and machine for planning and creative problem solving [AD-704810] N70-34841
- PROCEEDINGS**
- Congressional hearings on establishing air quality criteria with respect to health and safety practices N70-35632
- PROSTHETIC DEVICES**
- Rejection of arm prosthetic devices by children with congenital deformities [PR-1103-70] N70-37224

## SUBJECT INDEX

- PROTECTIVE CLOTHING**
- Portable dry ice, water conditioned suit system [AD-700915] N70-36364
- PROTEIN METABOLISM**
- Hypokinesia effects on rats protein synthesis rates, determining body and organ weights, muscle tissue nitrogen content and transaminase activity A70-40187
- Protein biosynthesis of various forms of soluble ribonucleic acids and aminoacyl RNA synthetases [NASA-TT-P-13186] N70-37531
- PROTEINS**
- Protein solutions and cell cultures changes by ruby and Nd lasers radiation, noting threshold energy A70-39419
- Fractional composition of skeletal muscle proteins in white rats during hypokinesia N70-34995
- RNA concentration and protein synthesis in brain and memory retention under high altitude hypoxia stress N70-34997
- PROTON IRRADIATION**
- Proton irradiation effects on dogs with partial body protection A70-40192
- PSYCHOLOGICAL EFFECTS**
- Soviet book on man in aircraft control system covering engineering psychology, complex flight problems, human factors and instrument panels A70-37236
- Psychological effects of assigning unexpected tasks to operator in simulated space flight environment N70-35000
- PSYCHOLOGICAL FACTORS**
- Performance and response organization as uncertainty and structure function in pursuit tracking tasks A70-38320
- Panum phenomenon explained by projection, attraction and figure ground psychological theories A70-38505
- Interindividual differences in judging stimulus similarities, explaining unsatisfactory results obtained by average scalings A70-38506
- PSYCHOLOGICAL TESTS**
- Response bias of conservative human inference, using revised odds estimate experiments A70-38055
- Psychological tests for ability to learn association between event and occurrence probability A70-38319
- PSYCHOLOGY**
- Imaginary axes effect of phenomenal space in contrast illusions of distance, discussing division of S field of vision by definite point fixation A70-39764
- PSYCHOMETRICS**
- Personality correlates of centering of self in phenomenal field [AD-705065] N70-36551
- PSYCHOMOTOR PERFORMANCE**
- Steering behavior during learning as function of self generated stimuli by movement compared with stimulus tracking A70-39674
- Body surface cooling level and rate effects on psychomotor performance tested at various levels of mean weighted skin temperature /MWST/ A70-39675
- Rat neuron impulsive reactions and frequency response differences to varying sound signals, discussing time constant, signal intensity and frequencies A70-40172
- High temperature effects on performance of complex tasks by senior pilots [AD-703632] N70-35090
- PSYCHOPHYSICS**
- Human monitoring behavior, discussing display, task and organismic variables effects A70-38323

## SUBJECT INDEX

## RADIOACTIVE ISOTOPES

## PSYCHOPHYSIOLOGY

Attention direction role in auditory recognition,  
testing unwanted inputs attenuation hypothesis  
A70-38317

Flight training quality prediction by  
multidimensional regression analysis, discussing  
relationship to candidates psychophysiological  
examinations  
A70-38964

## PULMONARY CIRCULATION

Dynamic intravascular pressures measured in small  
vessels of frog lung using micropressure  
transducer inserted into vessel lumen  
A70-38368

Mongrel dogs pulmonary and systemic circulatory  
responses to dopamine infusion  
A70-38986

Pulmonary hypertension in congenital heart  
diseases as function of blood flow  
A70-39367

Lung alveolar and capillary wall structure in  
mammals under normal conditions, transverse  
acceleration and mechanically changed pulmonary  
circulation  
A70-40190

## PULMONARY LESIONS

Hyperbaric oxygen exposure produced hypertension  
and pulmonary edema, discussing carbon dioxide  
transport mechanism in blood  
A70-39430

## PULSE GENERATORS

Pulse coding system for average evoked EEG  
potential data acquisition and analysis,  
describing pulse generation circuitry and  
computer implemented logic  
A70-38985

## PUMPS

Perfusion peristaltic pump for determining smooth  
muscle reaction in vascular bed, discussing  
applications to physiological and  
pharmacological investigations  
A70-38958

## PURSUIT TRACKING

Performance and response organization as  
uncertainty and structure function in pursuit  
tracking tasks  
A70-38320

## Q

## QUANTITATIVE ANALYSIS

Human body radioactive nuclides in vivo  
quantitative analysis by gamma ray spectra,  
considering matrix method accuracy  
A70-40449

Quantitative analysis of rare earth elements in  
plants using thermal neutron irradiation and  
chromatography  
[CEA-R-3917]  
N70-37015

## R

## RADAR EQUIPMENT

Radar consoles with various display components  
under different illumination levels to determine  
optimal operator performance, discussing push-  
button design recommendations  
A70-39713

## RADIATION DAMAGE

Soviet book on dynamics of postradiation damage of  
biological objects covering dosage and  
protection effects on various animals  
A70-39824

Free radicals/radiation dosage linear relationship  
in alanine using electron paramagnetic resonance  
for biological tissue radiation damage study  
[CEA-R-3913]  
N70-36998

Computer programs for fast neutron thermalization,  
thermal neutron scattering, and gamma radiation  
damage  
[CEA-R-3994]  
N70-37113

## RADIATION DOSAGE

Soviet book on dynamics of postradiation damage of  
biological objects covering dosage and  
protection effects on various animals  
A70-39824

Genetic effects of radiation dosage on Neurospora  
during Gemini 11 and biosatellite 2 missions  
[NASA-CR-112354]  
N70-36826

Radioactive contamination of human body bone  
marrow by strontium 90 as function of age and  
radiation dosage times  
[CEA-R-3952]  
N70-36993

Radiation dosage of Tc 99 iron/II/ complex for  
brain tumors  
[LIB/TRANS-237]  
N70-37581

## RADIATION EFFECTS

Ionizing radiation effects on endocrine system,  
studying ACTH metabolism in rats under X ray  
irradiation  
A70-38723

Protein solutions and cell cultures changes by  
ruby and Nd lasers radiation, noting threshold  
energy  
A70-39419

Simulated space flight radiation effects on dogs  
DNA synthesis and bone marrow cell  
differentiation  
A70-40191

Proton irradiation effects on dogs with partial  
body protection  
A70-40192

Microwave radiation effects on maintenance  
personnel, investigating respiratory reaction,  
attention concentration, blood content of K, Ca,  
Na and proteins, etc  
A70-40289

Prolonged space flight simulation and irradiation  
effects on dogs treated with ATP and amytetravil  
drugs  
N70-34990

Frequency and origin of somatic and genetic  
radiation damage for external irradiation or  
after incorporation of radionuclides  
[EUR-4405-D]  
N70-36291

Radioactive contamination of human body bone  
marrow by strontium 90 as function of age and  
radiation dosage times  
[CEA-R-3952]  
N70-36993

Stability of new compounds derived from uracil and  
thiouracil after gamma ray irradiation  
[CEA-R-3962]  
N70-37080

Epidemiologic and experimental studies of  
radiation bio-effects  
[PB-190110]  
N70-37320

Abiogenesis and effect of ultraviolet radiation on  
one-celled organisms  
[NASA-TT-R-13188]  
N70-37502

## RADIATION HAZARDS

Physical and chemical characteristics and possible  
hazards from particulate matter released from  
Phoebus 1B - EP 4 reactor  
[SWRHL-46-R]  
N70-37340

## RADIATION INJURIES

He-Ne laser beam hazard to human retina  
A70-38309

Ruby laser radiation injury relationship to  
position and number of energy absorbing pigment  
particles in iris  
A70-39425

## RADIATION PROTECTION

Psychotropic drugs radioprotective effects in mice,  
noting oxygen consumption and body temperature  
decrease after X ray exposure  
A70-37558

Soviet book on dynamics of postradiation damage of  
biological objects covering dosage and  
protection effects on various animals  
A70-39824

Proton irradiation effects on dogs with partial  
body protection  
A70-40192

## RADIO TELEMETRY

Dynamic radio telemetry in physiology and  
medicine, discussing recordable parameters,  
multichannel systems, automatic data processing,  
etc  
A70-38216

## RADIOACTIVE CONTAMINANTS

Radioactive contamination of human body bone  
marrow by strontium 90 as function of age and  
radiation dosage times  
[CEA-R-3952]  
N70-36993

Treating radioactive contamination of human  
organism by using tritiated water  
[CEA-R-3974]  
N70-37111

## RADIOACTIVE ISOTOPES

Human body radioactive nuclides in vivo



# RADIOACTIVITY

# SUBJECT INDEX

quantitative analysis by gamma ray spectra,  
considering matrix method accuracy A70-40449

Radiological physics report, including studies on  
radioelement toxicity, air pollution, Ce-137  
fallout, and dosimetry [ANL-7615] N70-37435

**RADIOACTIVITY**  
Bibliography on natural environmental  
radioactivity [WASH-1061-SUPPL] N70-37128

**RADIOBIOLOGY**  
External measurement of Fe-59 ferrokinetics  
[AD-705046] N70-36467  
Epidemiologic and experimental studies of  
radiation bio-effects [PB-190110] N70-37320

**RADIOISOTOPE BATTERIES**  
Vacuum distillation vapor filtered catalytic  
oxidation for water reclamation from human  
waste, using radioisotopes for thermal energy A70-39437

**RADIOLOGY**  
Radiological physics report, including studies on  
radioelement toxicity, air pollution, Ce-137  
fallout, and dosimetry [ANL-7615] N70-37435

**RAPID EYE MOVEMENT STATE**  
Nocturnal headache relationship to REM sleep stage  
from EEG, EOG and EMG data A70-38994

Desynchronized sleep phase in cats, discussing  
activation and hippocampal theta and hippocampal  
delta rhythm predominance stages A70-40171

**RARE EARTH ELEMENTS**  
Quantitative analysis of rare earth elements in  
plants using thermal neutron irradiation and  
chromatography [CEA-R-3917] N70-37015

**RATS**  
Rat neuron impulsive reactions and frequency  
response differences to varying sound signals,  
discussing time constant, signal intensity and  
frequencies A70-40172

Hypokinesia effects on rats protein synthesis  
rates, determining body and organ weights,  
muscle tissue nitrogen content and transaminase  
activity A70-40187

Myocardial Na and K content of rats exposed to  
high altitude, preparing isolated right  
ventricular strip A70-40541

Fasting plasma glucose concentration in rats after  
chronic hypoxia A70-40542

Nitrogen trifluoride effects on rat cardiovascular  
system [AD-705045] N70-36468

**REACTION KINETICS**  
Hypokinesia effects on rats protein synthesis  
rates, determining body and organ weights,  
muscle tissue nitrogen content and transaminase  
activity A70-40187

External measurement of Fe-59 ferrokinetics  
[AD-705046] N70-36467

**REACTION TIME**  
Heat stress effects on serial reaction time in  
subjects performing visual tasks A70-38053

Human response time to visual stimulus preceding  
or following auditory stimulus as function of  
interstimulus interval A70-38311

Reaction time intersensory facilitation  
relationship to single channel theories of  
attention and human performance A70-38312

Preliminary taxonomy for errors in serial, self-  
paced choice reaction time experiments,  
discussing speed-error tradeoff A70-38313

Choice reaction and movement time dependence on  
hypoxia induced by air pressure reduction inside  
decompression chamber, discussing adult human  
performance

Bibliography on reaction time in human information  
processing tasks [AD-703857] N70-35375

**REAL TIME OPERATION**  
Real time analog display inputs for electronic  
computers and tracking in physiological control  
circuits, describing various manual controls A70-37564

Frank orthogonal vectorcardiograms on humans  
during acceleration, using beat-by-beat real  
time analog-digital computer technique A70-39435

**REDUCTION (CHEMISTRY)**  
Chemical reduction capacity of various microflora  
found in silt and soil deposits from different  
biochemical regions [NASA-TT-F-13197] N70-36013

**REFLEXES**  
Soviet monograph on secondary signaling system  
role in development of speech, thought,  
conditioned and unconditioned reflexes, human  
will and hypnosis, noting salivary gland  
function A70-37407

**REGRESSION ANALYSIS**  
Flight training quality prediction by  
multidimensional regression analysis, discussing  
relationship to candidates psychophysiological  
examinations A70-38964

Adaptive mathematical model development for  
deriving automated pilot performance measurement  
techniques [AD-704597] N70-36244

Nonlinear regression analysis of biomedical data  
by time-sharing computers [AD-704858] N70-36541

**REINFORCEMENT (PSYCHOLOGY)**  
Adaptive controller machine based on application  
of generalized punishments or rewards [AD-703758] N70-35311

**REINFORCING FIBERS**  
Development of nylon-linen webbing material for  
restraint harness in Apollo spacecraft [NASA-TM-X-64437] N70-35661

**REJECTION**  
Rejection of arm prosthetic devices by children  
with congenital deformities [FR-1103-70] N70-37224

**RELATIVISTIC EFFECTS**  
Reflection of reality as mechanism controlling  
behavior of life [JPRS-51176] N70-37279

**RELATIVITY**  
Reflection of reality as mechanism controlling  
behavior of life [JPRS-51176] N70-37279

**RENAL FUNCTION**  
Renal hemodynamic response of unanesthetized dogs  
to positive accelerations within physiological  
tolerance range, measuring pressure and blood  
flow velocity A70-40332

Renal hemodynamic response of unanesthetized dogs  
to negative acceleration [AD-702745] N70-36301

**RESONANT FREQUENCIES**  
HF ballistocardiograms resonance distortions  
correction, using electrical selective filters A70-38210

Ulnar resonant frequency reproducibility as  
objective measure of skeletal status, discussing  
forearm and hand positioning effect A70-39432

**RESOURCES**  
Proposed legislation for conducting research and  
studies on ecological systems, natural  
resources, and environmental quality N70-36151

**RESPIRATION**  
Cardiac rhythm, respiration and rhythmical  
processes of alimentary tract, using digital  
data device A70-38214

Proceedings from symposium on inhalation  
carcinogenesis [CONF-691001] N70-37428

## RESPIRATORY DISEASES

Air transportation of respiratory failure patients, considering medical equipment adaptation for aircraft use A70-39440

## RESPIRATORY PHYSIOLOGY

Chloride ion shift of respiration occurring between plasma and erythrocytes as function of carbon dioxide, using rapid filtration method A70-38366

Human sensory perception associated with breathing, comparing physical stimulus intensity with judgement of magnitude A70-38370

Skeletal muscles static tension influence on dog respiratory center functional properties, showing increased frequency volume and sensitivity under stimulation A70-40174

## RESPIRATORY RATE

Human respiration activity measurement in pressure chamber with different pressures and mixture compositions by spiograph equipment A70-40175

Nitrogen trifluoride effects on rat cardiovascular system [AD-705045] N70-36468

## RESPIRATORY SYSTEM

Coulometric microrespirometer for long term numerical recording of oxygen consumption in respiratory chamber under sterile conditions A70-38372

Carbon dioxide tension in arterial blood effects on rhythmic volley activity of respiratory neurons in medulla oblongata N70-34993

Personal portable oxygen respiratory support equipment [NASA-CR-112402] N70-36414

Enzyme system of respiratory chain and oxidizing phosphorolysis in bacteria [NASA-TT-F-13187] N70-37564

## RESPIROMETERS

Coulometric microrespirometer for long term numerical recording of oxygen consumption in respiratory chamber under sterile conditions A70-38372

## RESPONSE BIAS

Response bias of conservative human inference, using revised odds estimate experiments A70-38055

## RESUSCITATION

Extracellular spontaneous sequences of action potentials of thalamic neurons during asphyxia in rats under artificial respiration A70-38306

## RETENTION (PSYCHOLOGY)

RNA concentration and protein synthesis in brain and memory retention under high altitude hypoxia stress N70-34997

## RETINA

He-Ne laser beam hazard to human retina A70-38309

Photoperiodism in animal organism, discussing retinal epithelium photosensitive substance accumulation and retino-hypothalamo-hypophyseal mechanism of pigmentation A70-38413

Plasma tocopherol concentrations and vitamin E deficiency in dogs, noting pathologic changes in smooth muscle, central nervous system, skeletal muscle and retina A70-38991

## RETINAL ADAPTATION

Prismatic adaptation under scotopic and photopic conditions in subjects, using transfer experiments A70-38052

Fast retinal potential luminosity functions [AD-703178] N70-35344

## RETINAL IMAGES

Retinal images smearing during voluntary saccadic eye movements, obtaining thresholds for horizontal and vertical stimuli bands A70-38927

Visual suppression linear dependence on angular size of voluntary saccadic eye movements, observing percentage of trials for stimulus

perception A70-38928

Temporal and spatial distribution of visual suppression during voluntary saccadic eye movement on different places of retina A70-38929

Geometrical figure fragmentation produced by intermittent illumination, examining dependence on presentation frequency and temporal factors A70-39491

Influences of visual angle and retinal speed on duration and intensity of illusory motion [AD-703634] N70-35354

## RHEOENCEPHALOGRAPHY

Rheoencephalographic changes as indication of psychic stress N70-37065

## RHYTHM (BIOLOGY)

Alpha rhythm phase coherence during photic blocking, examining pacemaker model A70-37811

Cardiac rhythm, respiration and rhythmical processes of alimentary tract, using digital data device A70-38214

Statistical analysis of short periodic time series in biological rhythms including cosinor, periodic regression, harmonic and synchronization analyses A70-38412

Photoperiodism in animal organism, discussing retinal epithelium photosensitive substance accumulation and retino-hypothalamo-hypophyseal mechanism of pigmentation A70-38413

Long rhythms of periodic disparate heritable diseases in man A70-38414

Cardiac contraction rhythm autocorrelation and spectral analysis in healthy subjects and patients with disturbed sinus node functional states A70-38963

## RIBONUCLEIC ACIDS

RNA concentration and protein synthesis in brain and memory retention under high altitude hypoxia stress N70-34997

Enzymatic activity in model with lipid membrane separating ribonuclease enzyme from RNA substrate [NASA-TT-F-13185] N70-37471

Protein biosynthesis of various forms of soluble ribonucleic acids and aminoacyl RNA synthetases [NASA-TT-F-13186] N70-37531

## ROTATING ENVIRONMENTS

Antimotion sickness drugs evaluated for effectiveness under standardized stress conditions in slow rotation room A70-39439

## ROVER PROJECT

Transport ratio for I-131 air to milk concentrations, determining mean value and statistical variation from Project Rover data A70-38012

## RUBY LASERS

Ruby laser radiation injury relationship to position and number of energy absorbing pigment particles in iris A70-39425

## S

## SACCHARONYCES

3-O-methyl-mannose neutral sugar identification as constituent of fungal polysaccharide A70-39625

## SAFETY DEVICES

Development of nylon-linen webbing material for restraint harness in Apollo spacecraft [NASA-TM-X-64437] N70-35661

Industrial safety harness assessment for aircraft serving personnel [FPRC/MEHO-246] N70-36510

## SCALING

Interindividual differences in judging stimulus similarities, explaining unsatisfactory results obtained by average scalings A70-38506

## SCANNING

## SUBJECT INDEX

## SCANNING

Pilot scanning dwell times and control workload in simulated instrument approach, using eye-point-of-regard /EPR/ measurements [AIAA PAPER 70-999] A70-39532

SCINTILLATION COUNTERS  
Mathematical methods for improving sharpness of scintigraphic images [CEA-R-3920] N70-37137

SEA WATER  
Performance of Apollo sea dye marking powder [NASA-TM-X-65045] N70-35724

SEARCH PROFILES  
Case history of search profiles and selective dissemination of information on intestine material absorption [OSTI-5027] N70-37047

SEARCHING  
Eye movements during visual search and meaningless pattern discrimination A70-38054

SELECTION  
Visual sensory storage item selection efficiency A70-38321

SELECTIVE DISSEMINATION OF INFORMATION  
Case history of search profiles and selective dissemination of information on intestine material absorption [OSTI-5027] N70-37047

SELF STIMULATION  
Steering behavior during learning as function of self generated stimuli by movement compared with stimulus tracking A70-39674

SEMICIRCULAR CANALS  
Adjustable headholder for semicircular canal caloric testing [AD-700738] N70-36435

SENSITIVITY  
Technology review on cutaneous sensitivity research [AD-704344] N70-35093

SENSORIMOTOR PERFORMANCE  
Heat stress effects on serial reaction time in subjects performing visual tasks A70-38053

Reaction time intersensory facilitation relationship to single channel theories of attention and human performance A70-38312

SENSORY DISCRIMINATION  
Human vigilance paradigm and physiology, discussing relationships between vigilance, signal detection and animal discrimination A70-38324

SENSORY FEEDBACK  
Visual sensory storage item selection efficiency A70-38321

SENSORY PERCEPTION  
Thermal thermesthesiometer for skin heat sensibility studies A70-37806

Human sensory perception associated with breathing, comparing physical stimulus intensity with judgement of magnitude A70-38370

SENSORY STIMULATION  
Vestibular thermal stimulation method using distilled water injected into ear, discussing nystagmus appearance and duration A70-37355

Soviet monograph on secondary signaling system role in development of speech, thought, conditioned and unconditioned reflexes, human will and hypnosis, noting salivary gland function A70-37407

Human spatio-temporal visual evoked response characteristics, showing potential gradient rotation in same period as input stimulus A70-37845

Reaction time intersensory facilitation relationship to single channel theories of attention and human performance A70-38312

Human sensory perception associated with breathing, comparing physical stimulus intensity with judgement of magnitude A70-38370

Temporal sensory integration and auditory and tactile thresholds [AD-703376] N70-35366

Vestibular and optokinetic stimulation effects on work capacity and reliability of human control operator in flying vehicle N70-36956

SHOCK ABSORBERS  
Shock absorbing couch for body support under high acceleration or deceleration forces [NASA-CASE-XMS-01240] N70-35152

SHOCK WAVES  
Nonlinear analysis of pressure waves and shock waves in blood vessels [NASA-CR-112864] N70-36857

SIGNAL ANALYSIS  
EEG analysis for poststimulus events, examining contingent negative variation and late positive wave of average evoked potential A70-37813

SIGNAL DISTORTION  
HF ballistocardiograms resonance distortions correction, using electrical selective filters A70-38210

SIGNAL ENCODING  
Pulse coding system for average evoked EEG potential data acquisition and analysis, describing pulse generation circuitry and computer implemented logic A70-38985

SIZE DETERMINATION  
Equidistance effects on human size and distance perception in visual alley A70-37771

SKIN (ANATOMY)  
Isopotential surface maps for body surface potential relation to ECG and Frank vectorcardiogram during QRS stages in children A70-39368

Technology review on cutaneous sensitivity research [AD-704344] N70-35093

SKIN TEMPERATURE (BIOLOGY)  
Thermal thermesthesiometer for skin heat sensibility studies A70-37806

Cutaneous liquid crystal temperature sensors for thermographic patterns of angina pectoris induced by treadmill exercise A70-38361

Body surface cooling level and rate effects on psychomotor performance tested at various levels of mean weighted skin temperature /MWST/ A70-39675

Human peripheral blood flow rewarming in cold ambient temperature, examining skin, rectal and tympanic membrane and oxygen uptake A70-40327

SLEEP  
Human sleep pattern changes due to acute sleep-waking cycle reversal A70-38990

Nocturnal headache relationship to REM sleep stage from EEG, EOG and EMG data A70-38994

Desynchronized sleep phase in cats, discussing activation and hippocampal theta and hippocampal delta rhythm predominance stages A70-40171

SOIL SCIENCE  
Geochemical ecology of plants [NASA-TT-F-13198] N70-36133

SOLAR RADIATION  
Human bioclimatology at high altitude, discussing energy balance in terms of net solar and terrestrial radiation balance in mountain area A70-37369

SOLID STATE LASERS  
Protein solutions and cell cultures changes by ruby and Nd lasers radiation, noting threshold energy A70-39419

SOUND INTENSITY  
Sound level vs duration evaluated for noise exposure using different exchange rates [ASA PAPER PP2] A70-39125

SOYUZ SPACECRAFT  
Medical monitoring system onboard Soyuz spacecraft, describing equipment design, data

## SUBJECT INDEX

## STANDARDS

- acquisition and analysis, telemetric recordings, etc  
A70-40193
- Physiological responses of Soyuz 6, 7, and 8 astronauts  
N70-34999
- SPACE ENVIRONMENT SIMULATION**
- Systemic bacterial infection resistance in white mice exposed to simulated hypobaric normoxic space cabin environment  
A70-39431
- Simulated space flight radiation effects on dogs DNA synthesis and bone marrow cell differentiation  
A70-40191
- Prolonged space flight simulation and irradiation effects on dogs treated with ATP and amytravir drugs  
N70-34990
- Stress effects of high noise levels on lower body negative pressure experiments  
[NASA-TN-D-5967]  
N70-37076
- Simulation test report for multiple docking adapter external handrail system evaluation  
[NASA-TM-X-53894]  
N70-37533
- Methods and procedures for evaluating internal mobility aids in multiple docking adapters  
[NASA-TM-X-53895]  
N70-37583
- SPACE FLIGHT FEEDING**
- Microwave feeding system for heating and cooking prepackaged meals during extended space missions  
A70-37747
- SPACE FLIGHT TRAINING**
- Psychological effects of assigning unexpected tasks to operator in simulated space flight environment  
N70-35000
- SPACE PERCEPTION**
- Equidistance effects on human size and distance perception in visual alley  
A70-37771
- Human spatio-temporal visual evoked response characteristics, showing potential gradient rotation in same period as input stimulus  
A70-37845
- Object identification and form of multidimensional discrimination space, using locus stimulus model  
A70-38051
- Topological characteristics effects on stereoscopic perception  
[DISS-4259]  
N70-36394
- Space simulator to produce visual properties of objects outside earth atmosphere and determine distance and rate perception  
[NASA-CR-112843]  
N70-37467
- SPACE RATIONS**
- Improved acceptability of feeding system of reversibly compressed, dehydrated food bars and cubes of sauces and seasonings  
[NASA-CR-112676]  
N70-36775
- SPACE SIMULATORS**
- Space simulator to produce visual properties of objects outside earth atmosphere and determine distance and rate perception  
[NASA-CR-112843]  
N70-37467
- SPACE SUITS**
- Portable contingency transfer life support system for crewman of Apollo missions providing oxygen and cooling  
A70-39441
- SPACECRAFT CABIN ATMOSPHERES**
- Hypoxia warning systems using polarographic sensor and miniaturized electronics for face-mask and cabin installation for aircraft and spacecraft  
A70-39429
- Systemic bacterial infection resistance in white mice exposed to simulated hypobaric normoxic space cabin environment  
A70-39431
- Incidence of hypoxia and hypercapnia at ambient temperature in white mice and rats in nitrogen-oxygen or helium-oxygen atmospheres  
N70-34992
- SPACECRAFT CABINS**
- Effect of cabin pressure on environmental control system  
[NASA-TM-X-65009]  
N70-35804
- SPACECRAFT COMPONENTS**
- Effectiveness of thermoradiation sterilization of spacecraft hardware  
[NASA-CR-109972]  
N70-35167
- Cleaning procedure effects on sterilization of spacecraft components  
[NASA-TM-X-53885]  
N70-37500
- SPACECRAFT ENVIRONMENTS**
- Soviet monograph on automated physiological measurements with onboard computers, covering EKG, EEG, electromyogram, respiration, muscular activity, etc  
A70-38797
- SPACECRAFT LANDING**
- Test program for determining visual reference requirements for pilot control of gliding parachutes used in landing spacecraft on land  
[NASA-TM-X-64430]  
N70-35696
- SPACECRAFT STERILIZATION**
- Research and developments in planetary quarantine program  
[NASA-CR-110046]  
N70-35931
- Philosophy and technology of unmanned spacecraft sterilization and planetary quarantine  
[NASA-TM-X-53884]  
N70-37461
- Cleaning procedure effects on sterilization of spacecraft components  
[NASA-TM-X-53885]  
N70-37500
- SPACECREWS**
- Medicobiological approach to living conditions for sustained residence and human activity during prolonged space flights, describing sealed chamber experiment  
A70-37525
- Breathing mask for Apollo command module spacecrew  
[NASA-TM-X-64441]  
N70-35728
- Crew training program for third manned Apollo mission  
[NASA-TM-X-65047]  
N70-35788
- Water management during flight of Apollo spacecraft  
[NASA-TM-X-64445]  
N70-35803
- SPECTRUM ANALYSIS**
- Ballistocardiogram autocorrelation function and spectrum by scanning graph decoder and computer, determining total power, harmonics periodicity and energy concentration  
A70-38211
- Cardiac contraction rhythm autocorrelation and spectral analysis in healthy subjects and patients with disturbed sinus node functional states  
A70-38963
- Human body radioactive nuclides in vivo quantitative analysis by gamma ray spectra, considering matrix method accuracy  
A70-40449
- SPEECH**
- Soviet monograph on secondary signaling system role in development of speech, thought, conditioned and unconditioned reflexes, human will and hypnosis, noting salivary gland function  
A70-37407
- SPEECH RECOGNITION**
- Attention direction role in auditory recognition, testing unwanted inputs attenuation hypothesis  
A70-38317
- SPHYGMOGRAPHY**
- Human body elastic properties effects on arterial pressure measurement by sphygmomanometer  
A70-39879
- SPIROMETERS**
- Human respiration activity measurement in pressure chamber with different pressures and mixture compositions by spiograph equipment  
A70-40175
- SPORES**
- Alcohol sporulation evaluation for contamination control in stainless steels  
[NASA-TM-X-53891]  
N70-37585
- STABILITY**
- Stability of new compounds derived from uracil and thiouracil after gamma ray irradiation  
[CEA-R-3962]  
N70-37080
- STAINLESS STEELS**
- Alcohol sporulation evaluation for contamination control in stainless steels  
[NASA-TM-X-53891]  
N70-37585
- STANDARDS**
- Literature search with abstracts on visual

# STARCHES

# SUBJECT INDEX

performance standards for selection and retention of astronauts  
[NASA-CR-108587] N70-36362  
Air quality control standards for New Jersey, New York, and Connecticut  
[PB-191389] N70-37519

**STARCHES**  
Bibliography of irradiated sugar and starch diet effects on mammals, microorganisms and insects  
[CEA-BIB-178] N70-37139

**STATIC LOADS**  
Skeletal muscles static tension influence on dog respiratory center functional properties, showing increased frequency volume and sensitivity under stimulation A70-40174  
Hypokinesia and reduced diet effects on human tolerance to static loads, discussing acceleration tolerance prediction A70-40198

**STATISTICAL ANALYSIS**  
Statistical analysis of short periodic time series in biological rhythms including cosinor, periodic regression, harmonic and synchronization analyses A70-38412  
Criteria for rating proficient performance of complex job in aviation combat situation  
[AD-703510] N70-34944  
Statistical characteristics of images indicating forms  
[AD-700581] N70-36396

**STATISTICAL CORRELATION**  
Cardiovascular blood circulation system dynamic characteristics analysis by linear statistical correlation methods, describing test for determining weighting function A70-39905

**STEAM TURBINES**  
Feasibility of steam turbine for LEM environmental control system  
[NASA-TM-X-65008] N70-35733

**STEERING**  
Steering behavior during learning as function of self generated stimuli by movement compared with stimulus tracking A70-39674

**STEREOSCOPIC VISION**  
Distorting and distorted components during geometrical illusions stereoscopic registration A70-38926  
Hypoxia effects on aviators visual accommodation, convergence and stereocuity, noting myopia increase with altitude A70-38996  
Topological characteristics effects on stereoscopic perception  
[DISS-4259] N70-36394

**STERILIZATION**  
Subjects on planetary flight missions, supporting technology, microbial release probabilities, heat sterilization cycles N70-35043  
Effectiveness of thermoradiation sterilization of spacecraft hardware  
[NASA-CR-109972] N70-35167

**STIMULI**  
Interindividual differences in judging stimulus similarities, explaining unsatisfactory results obtained by average scalings A70-38506

**STORAGE**  
Simulation test data for storage box transfer through airlock module  
[NASA-TM-X-53887] N70-35915

**STRESS (PHYSIOLOGY)**  
Heat stress effects on serial reaction time in subjects performing visual tasks A70-38053  
Cardiovascular stress testing using posterior bipolar lead for radiotelemetry monitoring A70-39199  
Sinusoidal vibrations effects on rats at different air pressures, discussing human vibration tolerances and resonant frequencies of thoraco-abdominal system A70-39434  
Cerebral and symmetric vascular dynamics in response to stress

[AD-701941] N70-36397  
Heat stress effects on cellular structure and function  
[AD-705654] N70-36418  
Stress effects of high noise levels on lower body negative pressure experiments  
[NASA-TN-D-5967] N70-37076

**STRESS (PSYCHOLOGY)**  
Air traffic controller stress reduction, discussing work-rest intervals and various management and human factors A70-38647  
Stress effects on human nervous system and physiological responses  
[JPRS-51067] N70-37063  
Electrophysiological parameter changes after disturbance of motor conditioned reaction rhythm in man N70-37064  
Rheoencephalographic changes as indication of psychic stress N70-37065

**STRONTIUM 90**  
Radioactive contamination of human body bone marrow by strontium 90 as function of age and radiation dosage times  
[CEA-R-3952] N70-36993  
Age factor and human tolerance to radioactive contamination of diets in different European regions by strontium 90 and cesium 137  
[CEA-R-3861] N70-37074

**STRUCTURAL DESIGN**  
Design of inflatable life raft for aircrafts and boats  
[NASA-CASE-XMS-00863] N70-34857

**SUBMERGING**  
Book on survival in cold water covering physiology and treatment of immersion hypothermia and drowning, thermoregulation, etc A70-37977  
Preliminary physical training for human water immersion resistance improvement A70-40196  
Water immersion for weightlessness simulation in astronaut training  
[NASA-TM-X-64428] N70-35749

**SUGARS**  
3-O-methyl-mannose neutral sugar identification as constituent of fungal polysaccharide A70-39625  
Bibliography of irradiated sugar and starch diet effects on mammals, microorganisms and insects  
[CEA-BIB-178] N70-37139

**SURFACE COOLING**  
Body surface cooling level and rate effects on psychomotor performance tested at various levels of mean weighted skin temperature /MWST/ A70-39675

**SURVIVAL**  
Book on survival in cold water covering physiology and treatment of immersion hypothermia and drowning, thermoregulation, etc A70-37977  
Endogenous metabolism and survival of non-spore forming anaerobic bacteria under starving conditions  
[AD-703930] N70-36272

**SURVIVAL EQUIPMENT**  
Lightweight life preserver without fastening devices  
[NASA-CASE-XMS-00864] N70-36493

**SUSPENDING (MIXING)**  
Erythrocyte suspension subjected to gas bubble ultrasonic oscillation, investigating hemolysis mechanism A70-39981

**SYMPTOMOLOGY**  
Acute mountain sickness symptomatology and cognitive performance, using standardized General High Altitude Questionnaire A70-40025

**SYNAPSES**  
Evolution of cholinergic mediatory process in mollusks  
[NASA-TT-F-13192] N70-36132

**SYSTOLIC PRESSURE**  
Hemodynamic effect of lidocaine given by infusion and bolus injections in myocardial infarction, examining cardiac output, heart rate, systolic



# SUBJECT INDEX

# TRAINING SIMULATORS

- left ventricular and aortic pressures A70-38575
- T**
- TACTILE DISCRIMINATION**  
Temporal sensory integration and auditory and tactile thresholds  
[AD-703376] N70-35366
- TASK COMPLEXITY**  
Optimum attention allocation, discussing distraction resistance and multiple task performance A70-38316  
Enhanced evoked potentials sited by auditory stimuli in complex task, considering EEG and neurophysiological basis of selective attention A70-38318  
Human monitoring behavior, discussing display, task and organismic variables effects A70-38323
- TAXONOMY**  
Preliminary taxonomy for errors in serial, self-paced choice reaction time experiments, discussing speed-error tradeoff A70-38313
- TECHNETIUM COMPOUNDS**  
Radiation dosage of Tc 99 iron/II/ complex for brain tumors  
[LIB/TRANS-237] N70-37581
- TEETH**  
Repair of dental enamel using calcium phosphate gel  
[NASA-CASE-ERC-10338] N70-36053
- TELEVISION SYSTEMS**  
TV display simulation of instrument and visual aircraft landing approaches, investigating color, collimation and resolution effects on pilot evaluations A70-39172
- TEMPERATURE EFFECTS**  
Circadian rhythms in single cell animals, examining cell division, temperature and light effects A70-38410  
Blood vessels constriction in rear limbs, small intestine and spleen of dog with arterial blood heated above rectal temperature A70-40173  
Hypoxia and high ambient temperature effects on altitude tolerance in animals A70-40186
- TEMPERATURE SENSORS**  
Cutaneous liquid crystal temperature sensors for thermographic patterns of angina pectoris induced by treadmill exercise A70-38361
- TENSILE STRESS**  
Mathematical representation of heart muscle mechanical properties, examining tensile stress in parallel and series elements A70-37809
- TERRAIN**  
Geographic orientation in air operations for military aircraft systems  
[AD-705021] N70-36457
- TERRESTRIAL RADIATION**  
Human bioclimatology at high altitude, discussing energy balance in terms of net solar and terrestrial radiation balance in mountain area A70-37369
- TEST EQUIPMENT**  
Multiple choice rotation chair for clinical experimental research and pilot vestibular tests A70-39438
- TEXTURES**  
Statistical characteristics of images indicating forms  
[AD-700581] N70-36396
- THALAMUS**  
Extracellular spontaneous sequences of action potentials of thalamic neurons during asphyxia in rats under artificial respiration A70-38306
- THERMAL DEGRADATION**  
Toxicity problems from burning or heating of polymeric materials, discussing laboratory experiments and standardized toxicity testing procedures
- THERMAL VACUUM TESTS**  
Crew training program for lunar module thermal vacuum testing  
[NASA-TM-X-65082] N70-35857
- THERMOREGULATION**  
Book on survival in cold water covering physiology and treatment of immersion hypothermia and drowning, thermoregulation, etc A70-37977  
Circadian and seasonal adaptive function rhythms in animals, discussing terrestrial environment and thermoregulation A70-38409  
Human body core temperature control dependence during exercise on heat dissipation, noting sweating control A70-38997  
Human peripheral blood flow rewarming in cold ambient temperature, examining skin, rectal and tympanic membrane and oxygen uptake A70-40327
- THRESHOLDS (PERCEPTION)**  
Technology review on cutaneous sensitivity research  
[AD-704344] N70-35093
- TIME DEPENDENCE**  
Sound level vs duration evaluated for noise exposure using different exchange rates  
[ASA PAPER FF2] A70-39125  
Geometrical figure fragmentation produced by intermittent illumination, examining dependence on presentation frequency and temporal factors A70-39491  
Temporal and spectra combination effects on aircraft sound judged noisiness, using human subjects in anechoic chamber A70-39712
- TIME LAG**  
Human response time to visual stimulus preceding or following auditory stimulus as function of interstimulus interval A70-38311
- TIME RESPONSE**  
Component decision logical and temporal arrangement in visual search, defining target by several attribute value combination A70-38314
- TIME SERIES ANALYSIS**  
Statistical analysis of short periodic time series in biological rhythms including cosinor, periodic regression, harmonic and synchronization analyses A70-38412
- TISSUES (BIOLOGY)**  
Heat stress effects on cellular structure and function  
[AD-705654] N70-36418  
Free radicals/radiation dosage linear relationship in alanine using electron paramagnetic resonance for biological tissue radiation damage study  
[CEA-R-3913] N70-36998
- TOCOPHEROL**  
Plasma tocopherol concentrations and vitamin E deficiency in dogs, noting pathologic changes in smooth muscle, central nervous system, skeletal muscle and retina A70-38991
- TOPOLOGY**  
Topological characteristics effects on stereoscopic perception  
[DISS-4259] N70-36394
- TORSO**  
Digital computer model of total body ECG surface maps, simulating male torso with lungs A70-39369
- TOXICOLOGY**  
Toxicity problems from burning or heating of polymeric materials, discussing laboratory experiments and standardized toxicity testing procedures A70-39406
- TRACKING (POSITION)**  
Steering behavior during learning as function of self generated stimuli by movement compared with stimulus tracking A70-39674
- TRAINING SIMULATORS**  
Mission training program for Apollo Lunar Landing



## TRANSFER OF TRAINING

Mission  
[NASA-TM-X-65078] N70-35826

TRANSFER OF TRAINING  
Automatic control systems using small animals  
[AD-703085] N70-35636

TRANSFORMATIONS (MATHEMATICS)  
Preliminary conversion of images in visual imaging  
identification system  
[AD-703380] N70-35362

TRANSPLANTATION  
Circadian rhythms from electrocardiogram and  
cardiotachogram of patient with human heart  
transplant, noting P waves relationship between  
donor and recipient tissues  
A70-39166

TRANSPORT PROPERTIES  
Auxin downward transport by gravity in leaves,  
examining ethylene inhibition  
A70-39234

Microorganism transport through small orifices in  
bio-barrier fluid flow  
[NASA-CR-66703] N70-35877

Physical characteristics of synthetic and nerve  
membranes  
[AD-698816] N70-36431

TRANSPORT VEHICLES  
Air pollution threat in Sacramento, California,  
projected population, vehicles, and activities  
[PB-191382] N70-37433

TRANSVERSE ACCELERATION  
Prolonged transverse acceleration effects on rats  
kidney and posterior hypophysis neurosecretions  
A70-40188

Mineral and water metabolism in humans after  
exposure to transverse acceleration  
N70-35002

TRITIUM  
Treating radioactive contamination of human  
organism by using tritiated water  
[CEA-R-3974] N70-37111

TUMORS  
Radiation dosage of Tc 99 iron/II/ complex for  
brain tumors  
[LIB/TRANS-237] N70-37581

**U**

U.S.S.R. SPACE PROGRAM  
Transactions on aerospace biology and medicine  
[JPRS-50862] N70-34986

Aerospace medicine development in Russia  
N70-37005

ULNA  
Ulnar resonant frequency reproducibility as  
objective measure of skeletal status, discussing  
forearm and hand positioning effect  
A70-39432

ULTRASONIC AGITATION  
Erythrocyte suspension subjected to gas bubble  
ultrasonic oscillation, investigating hemolysis  
mechanism  
A70-39981

ULTRASONIC TESTS  
Ultrasonic nonsearch Doppler cardiography for  
cycle phase analysis, recording single functions  
A70-40199

ULTRASONIC WAVE TRANSDUCERS  
Electrolyteless ultrasonic Doppler biotelemetry  
cardiography system  
N70-35004

ULTRAVIOLET RADIATION  
Abiogenesis and effect of ultraviolet radiation on  
one-celled organisms  
[NASA-TT-F-13188] N70-37502

UNDERWATER TESTS  
Simulation test data for storage box transfer  
through airlock module  
[NASA-TM-X-53887] N70-35915

UNMANNED SPACECRAFT  
Philosophy and technology of unmanned spacecraft  
sterilization and planetary quarantine  
[NASA-TM-X-53884] N70-37461

UPPER ATMOSPHERE  
Bacteriological research in high atmospheric  
layers for microorganisms  
[AD-703889] N70-36232

URACIL  
Stability of new compounds derived from uracil and  
thiouracil after gamma ray irradiation

## SUBJECT INDEX

[CEA-R-3962] N70-37080

URINATION  
Changing gravity and weightlessness effects on  
vasopressin control systems, with immunochemical  
and biological assay studies  
[NASA-CR-112358] N70-36764

**V**

VACCINES  
Decreased mental and physical performance of human  
beings due to T-oral and placebo vaccine  
reactions  
A70-37389

VACUUM APPARATUS  
Vacuum distillation vapor filtered catalytic  
oxidation for water reclamation from human  
waste, using radioisotopes for thermal energy  
A70-39437

VACUUM EFFECTS  
Ambient near vacuum pressure effect on blood  
circulation, examining thoracic aorta blood  
flow, pressures, gas expansion and water  
vaporization  
A70-40326

VASCULAR SYSTEM  
Perfusion peristaltic pump for determining smooth  
muscle reaction in vascular bed, discussing  
applications to physiological and  
pharmacological investigations  
A70-38958

Cerebral and symmetric vascular dynamics in  
response to stress  
[AD-701941] N70-36397

VASOCONSTRICTION  
Cutaneous liquid crystal temperature sensors for  
thermographic patterns of angina pectoris  
induced by treadmill exercise  
A70-38361

Blood vessels constriction in rear limbs, small  
intestine and spleen of dog with arterial blood  
heated above rectal temperature  
A70-40173

Changing gravity and weightlessness effects on  
vasopressin control systems, with immunochemical  
and biological assay studies  
[NASA-CR-112358] N70-36764

VASODILATION  
Hypoxia effects on cerebral blood flow in  
anesthetized dogs, considering acidosis and  
vasodilation  
A70-40330

VECTORCARDIOGRAPHY  
Electrocardiogram vs vectorcardiogram for  
myocardial infarction diagnosis  
A70-38362

Isopotential surface maps for body surface  
potential relation to ECG and Frank  
vectorcardiogram during QRS stages in children  
A70-39368

Frank orthogonal vectorcardiograms on humans  
during acceleration, using beat-by-beat real  
time analog-digital computer technique  
A70-39435

VENTILATION  
Athletes ventilation and heart rate dynamic  
responses to supine leg exercise with sinusoidal  
work load  
A70-40329

Oxygen uptake at alveolar capillary membrane,  
investigating ventilation variability at  
exercise onset  
A70-40331

VENTRAL SECTIONS  
Myocardial Na and K content of rats exposed to  
high altitude, preparing isolated right  
ventricular strip  
A70-40541

VERBAL COMMUNICATION  
Linguistic competence of languages and performance  
grammars in machine conversation  
[P-4391] N70-36107

VERTICAL TAKEOFF AIRCRAFT  
Computer simulated decision hierarchical model of  
helicopter and VTOL pilot for multiloop closure  
and tracking characteristics of man-vehicle  
system  
A70-38921

## VESTIBULAR TESTS

- Vestibular thermal stimulation method using distilled water injected into ear, discussing nystagmus appearance and duration A70-37355
- Soviet book on peripheral vestibular apparatus and higher nervous system roles in motion sickness covering Coriolis acceleration tests, pilot training and selection, drugs, etc A70-37406
- Multiple choice rotation chair for clinical experimental research and pilot vestibular tests A70-39438
- State-of-the-art review on habituation processes and vestibular adaptation N70-34989
- Otolithic weight changes and vestibular disorders during weightlessness N70-35003

## VESTS

- Lightweight life preserver without fastening devices [NASA-CASE-XMS-00864] N70-36493

## VIBRATIONAL STRESS

- Sinusoidal vibrations effects on rats at different air pressures, discussing human vibration tolerances and resonant frequencies of thoraco-abdominal system A70-39434

## VIRUSES

- Hypobaric hypoxia effects on MM virus infection resistance in mice A70-39428
- Murine viruses in germfree mice selected for extraterrestrial life testing of Apollo lunar samples [NASA-CR-108589] N70-36473

## VISCERA

- Visceral blood flow during exercise in sled dogs, testing hypothetical compensatory decrease as cardiovascular reserve for skeletal muscle by biotelemetry A70-39366

## VISUAL ACCOMMODATION

- Cat lens motion in response to ciliary ganglion step and sinusoidal stimulation, indicating damped accommodative system A70-38925
- Hypoxia effects on aviators visual accommodation, convergence and stereoacuity, noting myopia increase with altitude A70-38996

## VISUAL ACUITY

- Influences of visual angle and retinal speed on duration and intensity of illusory motion [AD-703634] N70-35354
- Literature search with abstracts on visual performance standards for selection and retention of astronauts [NASA-CR-108587] N70-36362

## VISUAL DISCRIMINATION

- Object identification and form of multidimensional discrimination space, using locus stimulus model A70-38051
- Eye movements during visual search and meaningless pattern discrimination A70-38054
- Test program for determining visual reference requirements for pilot control of gliding parachutes used in landing spacecraft on land [NASA-TM-X-64430] N70-35696

## VISUAL FIELDS

- Prismatic adaptation under scotopic and photopic conditions in subjects, using transfer experiments A70-38052
- Imaginary axes effect of phenomenal space in contrast illusions of distance, discussing division of S field of vision by definite point fixation A70-39764

## VISUAL PERCEPTION

- Equidistance effects on human size and distance perception in visual alley A70-37771
- Geometrical figure fragmentation produced by intermittent illumination, examining dependence on presentation frequency and temporal factors A70-39491

- Task signal rate effects on human monitoring of static process [AD-703635] N70-35091
- Neuron reticulum model for visual information processing [JPRS-51142] N70-36036
- Topological characteristics effects on stereoscopic perception [DISS-4259] N70-36394
- Research in visual perception for carrier landing [AD-706036] N70-36480
- Consequences of tinting in aircraft windshields [AM-MEMO-26] N70-37511

## VISUAL SIGNALS

- Lighting and background effects on human binocular color vision of signal lights in industry A70-38923
- Past retinal potential luminosity functions [AD-703178] N70-35314

## VISUAL STIMULI

- Visual attention and temporal cortex stimulation effects on evoked electrical activity in monkey brain A70-37812
- Human spatio-temporal visual evoked response characteristics, showing potential gradient rotation in same period as input stimulus A70-37845
- Human brain LF activity in visual evoked response, determining relationship to stimulation A70-37846
- Object identification and form of multidimensional discrimination space, using locus stimulus model A70-38051
- Human response time to visual stimulus preceding or following auditory stimulus as function of interstimulus interval A70-38311
- Visual sensory storage item selection efficiency A70-38321
- Cat lens motion in response to ciliary ganglion step and sinusoidal stimulation, indicating damped accommodative system A70-38925
- Retinal images smearing during voluntary saccadic eye movements, obtaining thresholds for horizontal and vertical stimuli bands A70-38927
- Visual suppression linear dependence on angular size of voluntary saccadic eye movements, observing percentage of trials for stimulus perception A70-38928
- Temporal and spatial distribution of visual suppression during voluntary saccadic eye movement on different places of retina A70-38929

## VISUAL TASKS

- Heat stress effects on serial reaction time in subjects performing visual tasks A70-38053
- Component decision logical and temporal arrangement in visual search, defining target by several attribute value combination A70-38314
- Brightness contrast by human observer binocular matching, discussing neural networks models A70-38924
- Task signal rate effects on human monitoring of static process [AD-703635] N70-35091

## VOLUME

- Heart stroke volume estimation at submaximal exercise using blood hemoglobin content and heart rate A70-40328

## W

## WAKEFULNESS

- Human sleep pattern changes due to acute sleep-waking cycle reversal A70-38990

## WALKING

- Muscle function mechanics across knee joint in walking, relating tension to length, velocity and energy absorption A70-37810

# WAR GAMES

# SUBJECT INDEX

## WAR GAMES

Laboratory and field studies for data acquisition  
on tank crews during combat operations  
[AD-705705] N70-36449

## WARNING SYSTEMS

Hypoxia warning systems using polarographic sensor  
and miniaturized electronics for face-mask and  
cabin installation for aircraft and spacecraft  
A70-39429

## WATER

Preliminary physical training for human water  
immersion resistance improvement  
A70-40196

Macaca nemestrina total body water measurement by  
dilution technique  
A70-40333

## WATER MANAGEMENT

Water management during flight of Apollo  
spacecraft  
[NASA-TM-X-64445] N70-35803

## WATER POLLUTION

Biological field investigative techniques and  
practices of water pollution  
N70-36149

## WATER RECLAMATION

Vacuum distillation vapor filtered catalytic  
oxidation for water reclamation from human  
waste, using radioisotopes for thermal energy  
A70-39437

Life support systems based on Chlorella-bacterial  
culture, investigating water exchange and  
reclamation  
A70-40184

Pressurized liquid waste feed system for water  
reclamation in weightless environment  
[NASA-CASE-LAR-10365-1] N70-35619

## WEBS (SUPPORTS)

Development of nylon-linen webbing material for  
restraint harness in Apollo spacecraft  
[NASA-TM-X-64437] N70-35661

## WEIGHTING FUNCTIONS

Cardiovascular blood circulation system dynamic  
characteristics analysis by linear statistical  
correlation methods, describing test for  
determining weighting function  
A70-39905

## WEIGHTLESSNESS

Otolithic weight changes and vestibular disorders  
during weightlessness  
N70-35003

Pressurized liquid waste feed system for water  
reclamation in weightless environment  
[NASA-CASE-LAR-10365-1] N70-35619

Changing gravity and weightlessness effects on  
vasopressin control systems, with immunochemical  
and biological assay studies  
[NASA-CR-112358] N70-36764

## WEIGHTLESSNESS SIMULATION

Water immersion for weightlessness simulation in  
astronaut training  
[NASA-TM-X-64428] N70-35749

## WINDSHIELDS

Consequences of tinting in aircraft windshields  
[AM-MEMO-26] N70-37511

## WORDS (LANGUAGE)

Linguistic competence of languages and performance  
grammars in machine conversation  
[P-4391] N70-36107

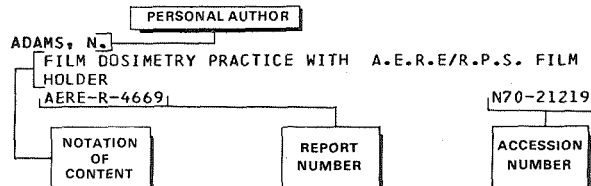
## WORK-REST CYCLE

Athletes ventilation and heart rate dynamic  
responses to supine leg exercise with sinusoidal  
work load  
A70-40329

# Personal Author Index

AEROSPACE MEDICINE AND BIOLOGY / a continuing bibliography NOVEMBER 1970

## Typical Personal Author Index Listing



The Notation of Content (NOC), rather than the title of the document, is used to provide a more exact description of the subject matter. The NASA or AIAA accession number is included in each entry to assist the user in locating the abstract in the abstract section of this supplement. If applicable, a report number is also included as an aid in identifying the document.

## A

- ABRAMOVA, G. M.  
Proton irradiation effects on dogs with partial body protection  
A70-40192
- ADAMS, C. K.  
Fast retinal potential luminosity functions  
[AD-703178]  
N70-35314
- ADAMS, F. H.  
Pathophysiology of congenital heart disease - Conference, University of California, Los Angeles, July 1967  
A70-39361
- AFANASEV, G. K.  
Ballistocardiogram autocorrelation function and spectrum by scanning graph decoder and computer, determining total power, harmonics periodicity and energy concentration  
A70-38211
- AGANIN, IU. I.  
Human mass exchange parameters permissible errors for manned space vehicles life support systems design  
A70-40200
- ALEXANDER, S.  
Circadian rhythms from electrocardiogram and cardiograph of patient with human heart transplant, noting P waves relationship between donor and recipient tissues  
A70-39166
- ALFORD, D. K.  
Rhythmic rotational movements in unifoliate leaves of Phaseolus angularis Wight grown under continuous light conditions  
[NASA-CR-112848]  
N70-37398
- ALLEN, M. J.  
Literature search with abstracts on visual performance standards for selection and retention of astronauts  
[NASA-CR-108587]  
N70-36362
- ALLEN, R. E.  
Stress effects of high noise levels on lower body negative pressure experiments  
[NASA-TN-D-5967]  
N70-37076
- ALLUISI, E. A.  
Human monitoring behavior, discussing display, task and organismic variables effects  
A70-38323
- AMOSOV, M. M.  
Soviet book on isolated animal heart autoregulation, considering cardio-pulmonary preparations, functional capacity, biometrics and computer technology for heart activity simulation models  
A70-37404
- ANANEV, V. M.  
Multipoint recording of bioelectric potentials based on electroencephalography, discussing multiple leadout, amplification, analysis, etc  
A70-38217
- ANDREASSI, J. L.  
Evoked potentials and visual information processing  
[AD-703330]  
N70-35504
- ANOKHIN, P. K.  
Reflection of reality as mechanism controlling behavior of life  
[JPRS-51176]  
N70-37279
- AOKI, V. S.  
Fasting plasma glucose concentration in rats after chronic hypoxia  
A70-40542
- ARMSTRONG, R. C.  
Sinusoidal vibrations effects on rats at different air pressures, discussing human vibration tolerances and resonant frequencies of thoraco-abdominal system  
A70-39434
- ARNOULT, M. D.  
Space simulator to produce visual properties of objects outside earth atmosphere and determine distance and rate perception  
[NASA-CR-112843]  
N70-37467
- ASSAYRENC, J.  
Free radicals/radiation dosage linear relationship in alanine using electron paramagnetic resonance for biological tissue radiation damage study  
[CEA-R-3913]  
N70-36998
- ASTARDZHIAN, G.  
Cardiac rhythm, respiration and rhythmical processes of alimentary tract, using digital data device  
A70-38214
- ATTERHOLM, G.  
Air traffic controller role in future air traffic system, considering automation in operations  
A70-38649
- AUCHINCLOSS, J. H., JR.  
Oxygen uptake at alveolar capillary membrane, investigating ventilation variability at exercise onset  
A70-40331
- AUSTEN, D. P.  
Literature search with abstracts on visual performance standards for selection and retention of astronauts  
[NASA-CR-108587]  
N70-36362
- AUTIAN, J.  
Toxicity problems from burning or heating of polymeric materials, discussing laboratory experiments and standardized toxicity testing procedures  
A70-39406

## B

- BABINSKY, A. D.  
Manned testing of flight breadboard oxygen system  
[NASA-CR-73395]  
N70-36933
- BAERTSCH, F.  
Reliability tests of blood carbon dioxide pressure measurement methods, indicating carbon dioxide-electrode method superiority  
A70-38371
- BAEVSKII, R. M.  
Soviet monograph on automated physiological measurements with onboard computers, covering

- EKG, EEG, electromyogram, respiration, muscular activity, etc  
A70-38797
- Cardiac contraction rhythm autocorrelation and spectral analysis in healthy subjects and patients with disturbed sinus node functional states  
A70-38963
- BAKER, C. H.  
Technology review on cutaneous sensitivity research  
[AD-704344]  
N70-35093
- BAKER, F. A.  
Unicellular hot spring acidophilic alga *Cyanidium cadarium* cultured in pure carbon dioxide, examining packed cell volume, oxygen production and growth rate  
A70-39492
- BAKERS, J. H. C. M.  
Human sensory perception associated with breathing, comparing physical stimulus intensity with judgement of magnitude  
A70-38370
- BARCERO, N.  
Hemodynamic changes in Andean native after two years at sea level, measuring intravascular pressures, cardiac output, heart rate and stroke index  
A70-39427
- BANISTER, E. W.  
Prolonged hyperbaric oxygen breathing effect on human physical performance at rest and during severe exercise  
A70-38369
- BARR, R. C.  
Isopotential surface maps for body surface potential relation to ECG and Frank vectorcardiogram during QRS stages in children  
A70-39368
- BARR, R. E.  
Low ambient temperature exposure effect on hamster intestinal absorption capacity, using glucose test compound  
A70-37772
- BARTSEVICH, B. N.  
Microwave radiation effects on maintenance personnel, investigating respiratory reaction, attention concentration, blood content of K, Ca, Na and proteins, etc  
A70-40289
- BAUER, C.  
Carbon dioxide content of dialyzed human hemoglobin measured at specific pressure and varying pH values as function of 2,3 diphosphoglycerate  
A70-38367
- BAULE, G. H.  
Oxygen uptake at alveolar capillary membrane, investigating ventilation variability at exercise onset  
A70-40331
- BAYEVSKIY, R. M.  
Physiological measurements and onboard computer processing for biotelemetric control of manned space flight  
[JPRS-50977]  
N70-35982
- BELIANIN, V. N.  
Life support systems based on *Chlorella*-bacterial culture, investigating water exchange and reclamation  
A70-40184
- BELL, C. R.  
Heat stress effects on serial reaction time in subjects performing visual tasks  
A70-38053
- BENDIXEN, C. D.  
Measurement of head angular acceleration during impact  
[AD-704704]  
N70-36249
- BENJAMIN, P.  
Computer simulated decision hierarchical model of helicopter and VTOL pilot for multiloop closure and tracking characteristics of man-vehicle system  
A70-38921
- BENNETT, A. W.  
Uncoated quartz twin crystal microbalance for monitoring water vapor content of respiratory gases  
A70-37844
- Multipurpose microminiature multichannel biomedical telemetry system, discussing design  
A70-37856
- BENNETT, R. L.  
Temporal and spectra combination effects on aircraft sound judged noisiness, using human subjects in anechoic chamber  
A70-39712
- BERG, K.  
Human peripheral blood flow rewarming in cold ambient temperature, examining skin, rectal and tympanic membrane and oxygen uptake  
A70-40327
- BERGER, G.  
Bibliography of irradiated sugar and starch diet effects on mammals, microorganisms and insects  
[CEA-BIB-178]  
N70-37139
- BERGER, L. R.  
Hydrostatic pressure effects on photosynthesis and growth of unicellular marine algae and diatoms  
[AD-704496]  
N70-36546
- BERMANN, F.  
Free radicals/radiation dosage linear relationship in alanine using electron paramagnetic resonance for biological tissue radiation damage study  
[CEA-R-3913]  
N70-36998
- BERNHARDT, D. E.  
Transport ratio for I-131 air to milk concentrations, determining mean value and statistical variation from Project Rover data  
A70-38012
- BERNSTEIN, I. H.  
Reaction time intersensory facilitation relationship to single channel theories of attention and human performance  
A70-38312
- BERTONE, C. M.  
Tests and test techniques for human performance prediction in man-machine systems tasks  
[NASA-CR-1614]  
N70-35379
- BEXON, J.  
Endogenous metabolism and survival of non-spore forming anaerobic bacteria under starving conditions  
[AD-703930]  
N70-36272
- BEYERLE, F. J.  
Philosophy and technology of unmanned spacecraft sterilization and planetary quarantine  
[NASA-TM-X-53884]  
N70-37461
- BJURE, J.  
Human arterial hypertension, correlating ECG changes with systemic hemodynamics  
A70-40069
- BLODGETT, J.  
Improved acceptability of feeding system of reversibly compressed, dehydrated food bars and cubes of sauces and seasonings  
[NASA-CR-112676]  
N70-36775
- BLUMHENSCHWEIN, S. D.  
Isopotential surface maps for body surface potential relation to ECG and Frank vectorcardiogram during QRS stages in children  
A70-39368
- BOEV, K.  
Cardiac rhythm, respiration and rhythmical processes of alimentary tract, using digital data device  
A70-38214
- BOINEAU, J. P.  
Isopotential surface maps for body surface potential relation to ECG and Frank vectorcardiogram during QRS stages in children  
A70-39368
- BOISVERT, L. J.  
Bibliography on reaction time in human information processing tasks  
[AD-703857]  
N70-35375
- BOKHOV, B. B.  
State-of-the-art review on habituation processes and vestibular adaptation  
N70-34989
- BOLKOV, B. N.  
Human respiration activity measurement in pressure chamber with different pressures and mixture compositions by spiograph equipment  
A70-40175
- BOURNE, J. R.  
Human spatio-temporal visual evoked response

- characteristics, showing potential gradient rotation in same period as input stimulus  
A70-37845
- BOWER, J. L.  
Adjustable headholder for semicircular canal caloric testing  
[AD-700738] N70-36435
- BOYLES, W. R.  
Criteria for rating proficient performance of complex job in aviation combat situation  
[AD-703510] N70-34944
- BRADY, A. J.  
Mechanical analysis involving clamping apparatus for cardiac muscle contractile response  
A70-39362
- BRAUNWALD, E.  
Determinants of human ventricular dimensions and myocardial free velocity relations during maximum and submaximum exercise levels  
A70-39365
- BRESLAV, I. S.  
Human respiration activity measurement in pressure chamber with different pressures and mixture compositions by spiograph equipment  
A70-40175
- BRICKER, R. W.  
Performance of Apollo sea dye marking powder  
[NASA-TM-X-65045] N70-35724
- BRILEY, P.  
Personality correlates of centering of self in phenomenal field  
[AD-705065] N70-36551
- BRODKEY, J. S.  
Cat lens motion in response to ciliary ganglion step and sinusoidal stimulation, indicating damped accommodative system  
A70-38925
- BROWN, J.  
Attention direction role in auditory recognition, testing unwanted inputs attenuation hypothesis  
A70-38317
- BROWN, J. T.  
Feasibility of steam turbine for LEM environmental control system  
[NASA-TM-X-65008] N70-35733
- BROWN, E. A.  
Data acquisition for confined groups of humans  
[AD-705066] N70-36574
- BROWN, W. K.  
Frank orthogonal vectorcardiograms on humans during acceleration, using beat-by-beat real time analog-digital computer technique  
A70-39435
- Human gluco-regulatory hormone reserve depressions following acute and chronic acceleration exposure  
A70-39436
- BRUNI, C. B.  
Task signal rate effects on human monitoring of static process  
[AD-703635] N70-35091
- BUCHSBAUM, R.  
Heat stress effects on cellular structure and function  
[AD-705064] N70-36418
- BULLARD, R. W.  
Myocardial Na and K content of rats exposed to high altitude, preparing isolated right ventricular strip  
A70-40541
- BUNDZEN, P. V.  
Electroencephalography with automatic frequency analysis to simulate processes involving brain self regulation  
A70-38218
- BURKETT, J. E.  
Test program for determining visual reference requirements for pilot control of gliding parachutes used in landing spacecraft on land  
[NASA-TM-X-64430] N70-35696
- BURNS, J. R.  
Air transportation of respiratory failure patients, considering medical equipment adaptation for aircraft use  
A70-39440
- BUSTO, R.  
Hypoxia effects on cerebral blood flow in anesthetized dogs, considering acidosis and vasodilation
- BUZNIKOV, G. A.  
Role of mediators in individual development and changes in their functions during evolution  
[NASA-TT-F-13191] N70-37559
- BYCHKOVSKAYA, I. E.  
Soviet book on dynamics of postradiation damage of biological objects covering dosage and protection effects on various animals  
A70-39824
- BYKOV, G. P.  
Morphological changes in bone and muscle tissue during hypokinesia  
N70-35005
- BYRD, R. B.  
Air transportation of respiratory failure patients, considering medical equipment adaptation for aircraft use  
A70-39440
- C
- CALL, R. W.  
Cardiovascular stress testing using posterior bipolar lead for radiotelemetry monitoring  
A70-39199
- CASTLE, B. L.  
Dynamic intravascular pressures measured in small vessels of frog lung using micropressure transducer inserted into vessel lumen  
A70-38368
- Human body core temperature control dependence during exercise on heat dissipation, noting sweating control  
A70-38997
- CERRETELLI, P.  
Heart stroke volume estimation at submaximal exercise using blood hemoglobin content and heart rate  
A70-40328
- CHAMBERS, J. B.  
Radar consoles with various display components under different illumination levels to determine optimal operator performance, discussing push-button design recommendations  
A70-39713
- CHASE, W. D.  
TV display simulation of instrument and visual aircraft landing approaches, investigating color, collimation and resolution effects on pilot evaluations  
A70-39172
- CHEREPAKHIN, M. A.  
Hypokinesia and reduced diet effects on human tolerance to static loads, discussing acceleration tolerance prediction  
A70-40198
- CHILDERS, D. G.  
Human spatio-temporal visual evoked response characteristics, showing potential gradient rotation in same period as input stimulus  
A70-37845
- Human brain LF activity in visual evoked response, determining relationship to stimulation  
A70-37846
- CHILDRESS, J. D.  
Repair of dental enamel using calcium phosphate gel  
[NASA-CASE-ERC-10338] N70-36053
- CHILES, W. D.  
High temperature effects on performance of complex tasks by senior pilots  
[AD-703632] N70-35090
- Task signal rate effects on human monitoring of static process  
[AD-703635] N70-35091
- CHINOSKEY, J. E.  
Renal hemodynamic response of unanesthetized dogs to positive accelerations within physiological tolerance range, measuring pressure and blood flow velocity  
A70-40332
- Renal hemodynamic response of unanesthetized dogs to negative acceleration  
[AD-702745] N70-36301
- CHUDAKOVA, I. V.  
Role of mediators in individual development and changes in their functions during evolution  
[NASA-TT-F-13191] N70-37559



## CHYARNYASKAS, Y. YU.

- Two methods for instructing classifier  
[AD-700806] N70-36500
- CLARK, B. A. J.  
Consequences of tinting in aircraft windshields  
[AM-MEMO-26] N70-37511
- CLARK, K. A.  
Anthropometric determinations of American born  
Macaca mulatta for orbiting primate experiment  
[AD-700907] N70-36495
- CLAUSER, C. E.  
Weight, volume, and center of mass of segments of  
human body  
[NASA-CR-112672] N70-36813
- CLOUDSLEY-THOMPSON, J. L.  
Circadian and seasonal adaptive function rhythms  
in animals, discussing terrestrial environment  
and thermoregulation  
A70-38409
- CLYMAN, B.  
Cardiovascular stress testing using posterior  
bipolar lead for radiotelemetry monitoring  
A70-39199
- COHEN, G. H.  
Frank orthogonal vectorcardiograms on humans  
during acceleration, using beat-by-beat real  
time analog-digital computer technique  
A70-39435
- COLLINS, W. E.  
Influences of visual angle and retinal speed on  
duration and intensity of illusory motion  
[AD-703634] N70-35354
- COLTON, G. M.  
Lighting and background effects on human binocular  
color vision of signal lights in industry  
A70-38923
- CONANT, N. P.  
3-O-methyl-mannose neutral sugar identification  
as constituent of fungal polysaccharide  
A70-39625
- CONNELLY, E. A.  
Adaptive mathematical model development for  
deriving automated pilot performance measurement  
techniques  
[AD-704597] N70-36244
- COPEMAN, J. W.  
Cardiovascular stress testing using posterior  
bipolar lead for radiotelemetry monitoring  
A70-39199
- CORDARO, J. T.  
Systemic bacterial infection resistance in white  
mice exposed to simulated hypobaric normoxic  
space cabin environment  
A70-39431
- COUDERC, B.  
Free radicals/radiation dosage linear relationship  
in alanine using electron paramagnetic resonance  
for biological tissue radiation damage study  
[CEA-R-3913] N70-36998
- COVINGTON, J. H.  
Water immersion for weightlessness simulation in  
astronaut training  
[NASA-TM-X-64428] N70-35749
- COWLISHAW, J.  
Lambda prophage induction into lysogens, noting  
naldixic acid role in DNA synthesis inhibition  
A70-39774
- CROWDER, W. F.  
Automatic control systems using small animals  
[AD-703085] N70-35636
- CRUZ, J. C.  
Hemodynamic changes in Andean native after two  
years at sea level, measuring intravascular  
pressures, cardiac output, heart rate and stroke  
index  
A70-39427
- CURTIS, D. L.  
Portable contingency transfer life support system  
for crewman of Apollo missions providing oxygen  
and cooling  
A70-39441
- CZAPEK, F.  
Mechanisms controlling orientation of side roots  
and other plagiotropic plant parts in geotropic  
critical angle  
[NASA-TT-F-12639] N70-36014

## D

- DA COSTA, J. R.  
Sound level measurements in industrial plants  
[TR-6910.386] N70-35320
- DANNE, R.  
Quantitative analysis of rare earth elements in  
plants using thermal neutron irradiation and  
chromatography  
[CEA-R-3917] N70-37015
- DANON, J.  
Vestibular thermal stimulation method using  
distilled water injected into ear, discussing  
nystagmus appearance and duration  
A70-37355
- DAVIDSON, M. B.  
Fasting plasma glucose concentration in rats after  
chronic hypoxia  
A70-40542
- DAVIES, L.  
Astronaut weight loss relation to flight duration  
during manned space missions  
A70-40125
- DAWES, E. A.  
Endogenous metabolism and survival of non-spore  
forming anaerobic bacteria under starving  
conditions  
[AD-703930] N70-36272
- DAWSON, W. W.  
Fast retinal potential luminosity functions  
[AD-703178] N70-35314
- DE BONNEVAL, P.  
Vestibular thermal stimulation method using  
distilled water injected into ear, discussing  
nystagmus appearance and duration  
A70-37355
- DE CHOUDENS, H.  
Free radicals/radiation dosage linear relationship  
in alanine using electron paramagnetic resonance  
for biological tissue radiation damage study  
[CEA-R-3913] N70-36998
- DE GROOT, A. P.  
Sterilization and storage effects on nutritional  
value of canned foods  
[R-3092] N70-35577
- DE SERRES, F. J.  
Genetic effects of radiation dosage on Neurospora  
during Gemini 11 and biosatellite 2 missions  
[NASA-CR-112354] N70-36826
- DEBAIN, J.-J.  
Vestibular thermal stimulation method using  
distilled water injected into ear, discussing  
nystagmus appearance and duration  
A70-37355
- DEBORIN, G. A.  
Enzymatic activity in model with lipid membrane  
separating ribonuclease enzyme from RNA  
substrate  
[NASA-TT-F-13185] N70-37471
- DEGTIAREV, V. A.  
Ultrasonic nonsearch Doppler cardiography for  
cycle phase analysis, recording single functions  
A70-40199
- DELBONNE, L. F.  
Sound level measurements in industrial plants  
[TR-6910.386] N70-35320
- DESCOURS, S.  
Free radicals/radiation dosage linear relationship  
in alanine using electron paramagnetic resonance  
for biological tissue radiation damage study  
[CEA-R-3913] N70-36998
- DEVILLERS, C.  
Computer programs for fast neutron thermalization,  
thermal neutron scattering, and gamma radiation  
damage  
[CEA-R-3994] N70-37113
- DEXTER, J. D.  
Nocturnal headache relationship to REM sleep stage  
from EEG, EOG and EMG data  
A70-38994
- DITTHAR, A.  
Analog computer for continuous recording of oxygen  
consumption of muscular area in canine foot via  
blood flow rate and oxygen saturation  
A70-37354
- DOBROBRADOVA, I. S.  
Stress effects on human nervous system and  
physiological responses

- [JPRS-51067] N70-37063  
Electrophysiological parameter changes after  
disturbance of motor conditioned reaction rhythm  
in man
- DOMANIEWSKI, J. N70-37064  
Antigens immunological response during myocardial  
infarction A70-39151
- DONCHIN, E. A70-37813  
EEG analysis for poststimulus events, examining  
contingent negative variation and late positive  
wave of average evoked potential
- Pulse coding system for average evoked EEG  
potential data acquisition and analysis,  
describing pulse generation circuitry and  
computer implemented logic A70-38985
- DOWENFELD, I. A70-38369  
Data acquisition for confined groups of humans  
[AD-705066] N70-36574
- DOYLE, T. C. A70-40189  
Human brain LF activity in visual evoked response,  
determining relationship to stimulation
- DUCHARME, W. M. A70-38055  
Response bias of conservative human inference,  
using revised odds estimate experiments
- DUDEK, R. A. A70-38923  
Lighting and background effects on human binocular  
color vision of signal lights in industry
- DUNCAN, W. R. A70-38369  
Prolonged hyperbaric oxygen breathing effect on  
human physical performance at rest and during  
severe exercise
- DURNOVA, G. N. A70-40189  
Mice immunobiological reactivity at simulated high  
altitude
- DYMOND, A. M. A70-39432  
Ulnar resonant frequency reproducibility as  
objective measure of skeletal status, discussing  
forearm and hand positioning effect
- E**
- EBERLE, J. L. A70-37875  
Display/control technology for high performance  
input/output between man and machine, describing  
man-in-loop simulation
- EDWARDS, W. A70-40185  
Applications of decision making, probability  
theory, and multi-level inference systems to  
aerospace information processing  
[NASA-CR-112842] N70-37468
- EGOROV, A. D. A70-40193  
Medical monitoring system onboard Soyuz  
spacecraft, describing equipment design, data  
acquisition and analysis, telemetric recordings,  
etc
- EGOROV, B. B. A70-40185  
Orthostatic tolerance increase in animals by  
application of hyperoxic and hypercapnic gas  
mixtures
- Medical monitoring system onboard Soyuz  
spacecraft, describing equipment design, data  
acquisition and analysis, telemetric recordings,  
etc A70-40193
- EPLER, H. A. A70-38215  
Arterial pressure measurement by automatic control  
system based on external compression pressure  
for maximum amplitude intraarterial pressure  
pulse oscillations
- ESPOSITO, J. J. N70-36364  
Portable dry ice, water conditioned suit system  
[AD-700915]
- ESTLER, C. J. A70-39366  
Effect of 3-methylisoxazole-5-carbonic acid on  
metabolism and thermoregulation of mice exposed  
to cold
- [NASA-TT-F-13158] N70-36110  
EVANS, W. O.  
Acute mountain sickness symptomatology and  
cognitive performance, using standardized  
General High Altitude Questionnaire A70-40025
- F**
- FABRE, J.-L. N70-37111  
Treating radioactive contamination of human  
organism by using tritiated water  
[CEA-R-3974]
- FAITH, L. N70-37433  
Air pollution threat in Sacramento, California,  
projected population, vehicles, and activities  
[PB-191382]
- FEDOROV, I. V. A70-40187  
Hypokinesia effects on rats protein synthesis  
rates, determining body and organ weights,  
muscle tissue nitrogen content and transaminase  
activity
- FEGER, H. A70-38504  
Choice prediction in partially repeatable decision  
situations, discussing phenomenological analysis
- FELIX, C. N70-37080  
Stability of new compounds derived from uracil and  
thiouracil after gamma ray irradiation  
[CEA-R-3962]
- FILLBRANDT, H. A70-38506  
Interindividual differences in judging stimulus  
similarities, explaining unsatisfactory results  
obtained by average scalings
- FINLEY, D. L. N70-35379  
Tests and test techniques for human performance  
prediction in man-machine systems tasks  
[NASA-CR-1614]
- FISHER, G. H. A70-38926  
Distorting and distorted components during  
geometrical illusions stereoscopic registration
- FITZPATRICK, E. L. A70-39435  
Frank orthogonal vectorcardiograms on humans  
during acceleration, using beat-by-beat real  
time analog-digital computer technique
- FLAHERTY, J. T. A70-39368  
Isopotential surface maps for body surface  
potential relation to ECG and Frank  
vectorcardiogram during QRS stages in children
- FLUOR, E. A70-39438  
Multiple choice rotation chair for clinical  
experimental research and pilot vestibular tests
- FOSTER, D. A70-39166  
Circadian rhythms from electrocardiogram and  
cardiotachogram of patient with human heart  
transplant, noting P waves relationship between  
donor and recipient tissues
- FOSTER, L. L. N70-36468  
Nitrogen trifluoride effects on rat cardiovascular  
system  
[AD-705045]
- FOURCY, A. N70-37015  
Quantitative analysis of rare earth elements in  
plants using thermal neutron irradiation and  
chromatography  
[CEA-R-3917]
- FOURT, L. N70-36340  
Analysis of comfort and function factors for  
clothing  
[AD-703143]
- FOX, S. W. A70-38992  
Cells chemical origin, discussing terrestrial  
fractionation, amino acids, macromolecules,  
metabolism, etc
- FRANKLIN, D. L. A70-39366  
Visceral blood flow during exercise in sled dogs,  
testing hypothetical compensatory decrease as  
cardiovascular reserve for skeletal muscle by  
biotelemetry

- Radio telemetry measurements of blood pressure and flow in unrestrained animals  
A70-39370
- FREYSS, G.  
Vestibular thermal stimulation method using distilled water injected into ear, discussing nystagmus appearance and duration  
A70-37355
- PROLOV, V. S.  
Soviet book on man in aircraft control system covering engineering psychology, complex flight problems, human factors and instrument panels  
A70-37236
- FUJISHIMA, M.  
Hypoxia effects on cerebral blood flow in anesthetized dogs, considering acidosis and vasodilation  
A70-40330
- FUNG, Y.-C.  
Mathematical representation of heart muscle mechanical properties, examining tensile stress in parallel and series elements  
A70-37809

## G

- GABUNIIA, R. I.  
Human body radioactive nuclides in vivo quantitative analysis by gamma ray spectra, considering matrix method accuracy  
A70-40449
- GAGOV, S.  
Perfusion peristaltic pump for determining smooth muscle reaction in vascular bed, discussing applications to physiological and pharmacological investigations  
A70-38958
- GALLIE, T. M.  
Isopotential surface maps for body surface potential relation to ECG and Frank vectorcardiogram during QRS stages in children  
A70-39368
- GAMALEIA, N. F.  
Protein solutions and cell cultures changes by ruby and Nd lasers radiation, noting threshold energy  
A70-39419
- GARBER, E. I.  
Flight training quality prediction by multidimensional regression analysis, discussing relationship to candidates psychophysiological examinations  
A70-38964
- GARCIA, J. F.  
Serum growth hormone response to hypoglycemia in man following insulin administration, reviewing lumped parameter model  
A70-38006
- GARNIER, A.  
Age factor and human tolerance to radioactive contamination of diets in different European regions by strontium 90 and cesium 137 [CEA-R-3861]  
N70-37074
- GEYER, D. J.  
Shock absorbing couch for body support under high acceleration or deceleration forces [NASA-CASE-XMS-01240]  
N70-35152
- Development of nylon-linen webbing material for restraint harness in Apollo spacecraft [NASA-TM-X-64437]  
N70-35661
- GELMAN, M. S.  
Enzyme system of respiratory chain and oxidizing phosphorylation in bacteria [NASA-TT-P-13187]  
N70-37564
- GERBRANDT, L. K.  
Visual attention and temporal cortex stimulation effects on evoked electrical activity in monkey brain  
A70-37812
- GIBBONS, H. L.  
High temperature effects on performance of complex tasks by senior pilots [AD-703632]  
N70-35090
- GILBERT, R.  
Oxygen uptake at alveolar capillary membrane, investigating ventilation variability at exercise onset  
A70-40331
- GILLESPIE, T. L.  
Digital computer model of total body ECG surface maps, simulating male torso with lungs  
A70-39369
- GINOZA, W.  
Lambda prophage induction into lysogens, noting nalidixic acid role in DNA synthesis inhibition  
A70-39774
- GINSBURG, E. V.  
Proton irradiation effects on dogs with partial body protection  
A70-40192
- GIROU, D. J.  
Hypobaric hypoxia effects on MM virus infection resistance in mice  
A70-39428
- GITELZON, I. I.  
Life support systems based on Chlorella-bacterial culture, investigating water exchange and reclamation  
A70-40184
- GOGEL, W. C.  
Equidistance effects on human size and distance perception in visual alley  
A70-37771
- GOLD, T.  
Research in visual perception for carrier landing [AD-706036]  
N70-36480
- GOLDMACHER, D.  
Human sleep pattern changes due to acute sleep-waking cycle reversal  
A70-38990
- GOLDSTEIN, S.  
Alpha rhythm phase coherence during photic blocking, examining pacemaker model  
A70-37811
- GORODINSKII, S. M.  
Medical monitoring system onboard Soyuz spacecraft, describing equipment design, data acquisition and analysis, telemetric recordings, etc  
A70-40193
- GORODINSKIY, S. M.  
Reduced atmospheric pressure effect on human elimination of gaseous and volatile metabolites in pressurized suits  
N70-35001
- GOROYAN, I. S.  
Statistical characteristics of images indicating forms [AD-700581]  
N70-36396
- GOULD, J. D.  
Eye movements during visual search and meaningless pattern discrimination  
A70-38054
- GOULD, J. W.  
Microwave feeding system for heating and cooking prepackaged meals during extended space missions  
A70-37747
- GRALL, Y.  
Vestibular thermal stimulation method using distilled water injected into ear, discussing nystagmus appearance and duration  
A70-37355
- GRAYBIEL, A.  
Antimotion sickness drugs evaluated for effectiveness under standardized stress conditions in slow rotation room  
A70-39439
- GRAYBIEL, A. M.  
Prismatic adaptation under scotopic and photopic conditions in subjects, using transfer experiments  
A70-38052
- GREEN, J. F.  
External measurement of Fe-59 ferrokinetics [AD-705046]  
N70-36467
- GREENLEAF, J. E.  
Human body core temperature control dependence during exercise on heat dissipation, noting sweating control  
A70-38997
- GRIGOREV, I. V. G.  
Proton irradiation effects on dogs with partial body protection  
A70-40192
- GRODZINSKII, D. E.  
Ionizing radiation effects on endocrine system, studying ACTH metabolism in rats under X ray

- irradiation  
A70-38723
- GUDA, V. A.  
Medical monitoring system onboard Soyuz spacecraft, describing equipment design, data acquisition and analysis, telemetric recordings, etc  
A70-40193
- GULIAN, E.  
Noise effects on arousal level in auditory vigilance from EEG parameters  
A70-38325
- GULTYAYEV, P. A.  
Incidence of hypoxia and hypercapnia at ambient temperature in white mice and rats in nitrogen-oxygen or helium-oxygen atmospheres  
N70-34992
- GUY, W. W.  
Water management during flight of Apollo spacecraft  
[NASA-TM-X-64445]  
N70-35803
- H**
- HAAB, P.  
Reliability tests of blood carbon dioxide pressure measurement methods, indicating carbon dioxide-electrode method superiority  
A70-38371
- HAGGARD, D. F.  
Laboratory and field studies for data acquisition on tank crews during combat operations  
[AD-705705]  
N70-36449
- HAGUE, E. B.  
Photoperiodism in animal organism, discussing retinal epithelium photosensitive substance accumulation and retino-hypothalamo-hypophyseal mechanism of pigmentation  
A70-38413
- HAGUE, T. E.  
Photoperiodism in animal organism, discussing retinal epithelium photosensitive substance accumulation and retino-hypothalamo-hypophyseal mechanism of pigmentation  
A70-38413
- HALL, J. B., JR.  
Pressurized liquid waste feed system for water reclamation in weightless environment  
[NASA-CASE-LAR-10365-1]  
N70-35619
- HALL, R. J.  
Technology review on cutaneous sensitivity research  
[AD-704344]  
N70-35093
- HALL, V. E.  
Pathophysiology of congenital heart disease - Conference, University of California, Los Angeles, July 1967  
A70-39361
- HALLERMAN, F. J.  
Electrocardiogram vs vectorcardiogram for myocardial infarction diagnosis  
A70-38362
- HARADA, K.  
Cells chemical origin, discussing terrestrial fractionation, amino acids, macromolecules, metabolism, etc  
A70-38992
- HARPER, J. W.  
External measurement of Fe-59 ferrokinetics  
[AD-705046]  
N70-36467
- HARRISON, D. C.  
Hemodynamic effect of lidocaine given by infusion and bolus injections in myocardial infarction, examining cardiac output, heart rate, systolic left ventricular and aortic pressures  
A70-38575
- Mongrel dogs pulmonary and systemic circulatory responses to dopamine infusion  
A70-38986
- HAUSTEIN, B.-G.  
Auditory direction finding ability, discussing experimental arrangement, white noise production, test conduction and statistical evaluation  
A70-40538
- HAYES, K. C.  
Plasma tocopherol concentrations and vitamin E deficiency in dogs, noting pathologic changes in smooth muscle, central nervous system, skeletal muscle and retina  
A70-38991
- HAYTHORN, W. W.  
Data acquisition for confined groups of humans  
[AD-705066]  
N70-36574
- HEARLD, A. B.  
Vacuum distillation vapor filtered catalytic oxidation for water reclamation from human waste, using radioisotopes for thermal energy  
A70-39437
- HEGSTED, D. H.  
Plasma tocopherol concentrations and vitamin E deficiency in dogs, noting pathologic changes in smooth muscle, central nervous system, skeletal muscle and retina  
A70-38991
- HEINWERTH, K.  
Panum phenomenon explained by projection, attraction and figure ground psychological theories  
A70-38505
- HEINRICH, F.  
Brightness contrast by human observer binocular watching, discussing neural networks models  
A70-38924
- HELD, D. R.  
Reliability tests of blood carbon dioxide pressure measurement methods, indicating carbon dioxide-electrode method superiority  
A70-38371
- HELD, R.  
Prismatic adaptation under scotopic and photopic conditions in subjects, using transfer experiments  
A70-38052
- HELLENDORF, E. W.  
Sterilization and storage effects on nutritional value of canned foods  
[R-3092]  
N70-35577
- HELLSTROM, B.  
Human peripheral blood flow rewarming in cold ambient temperature, examining skin, rectal and tympanic membrane and oxygen uptake  
A70-40327
- HEMINGWAY, A.  
Chloride ion shift of respiration occurring between plasma and erythrocytes as function of carbon dioxide, using rapid filtration method  
A70-38366
- HEMINGWAY, C. J.  
Chloride ion shift of respiration occurring between plasma and erythrocytes as function of carbon dioxide, using rapid filtration method  
A70-38366
- HENDRIX, C. E.  
Adaptive controller machine based on application of generalized punishments or rewards  
[AD-703758]  
N70-35311
- HENRY, P.  
Treating radioactive contamination of human organism by using tritiated water  
[CEA-R-3974]  
N70-37111
- HENSON, B. B.  
Stress effects of high noise levels on lower body negative pressure experiments  
[NASA-TN-D-5967]  
N70-37076
- HEUSNER, A. A.  
Coulometric microrespirometer for long term numerical recording of oxygen consumption in respiratory chamber under sterile conditions  
A70-38372
- HIGGINS, E. A.  
High temperature effects on performance of complex tasks by senior pilots  
[AD-703632]  
N70-35090
- HODGE, D. H.  
Epidemiologic and experimental studies of radiation bio-effects  
[PB-190110]  
N70-37320
- HOLLIES, N. R. S.  
Analysis of comfort and function factors for clothing  
[AD-703143]  
N70-36340
- HOMER, L. D.  
Nonlinear regression analysis of biomedical data by time-sharing computers  
[AD-704858]  
N70-36541
- HOPKIN, V. D.  
Human factors in ATC, discussing simulation trials

- and impending problems A70-38648
- HORNHAW, A. H.  
Complementary capabilities of man and machine for  
planning and creative problem solving  
[AD-704810] N70-34841
- HORWITZ, D. L.  
Nonlinear regression analysis of biomedical data  
by time-sharing computers  
[AD-704858] N70-36541
- HOWARD, D. C.  
Personal portable oxygen respiratory support  
equipment  
[NASA-CR-112402] N70-36414
- HOWARD, J. C.  
Serum growth hormone response to hypoglycemia in  
man following insulin administration, reviewing  
lumped parameter model A70-38006
- Mathematical model of human pituitary gland  
mechanism controlling secretions of serum growth  
hormone in response to glucose deficiency A70-38995
- HUDOCK, P. F.  
Operational profile and mission of certified  
non-instrument rated commercial pilot  
[FAA-RD-70-50] N70-36936
- HUDOCK, R. P.  
Operational profile and mission of certified  
non-instrument rated commercial pilot  
[FAA-RD-70-50] N70-36936
- HUNT, D.  
Cutaneous liquid crystal temperature sensors for  
thermographic patterns of angina pectoris  
induced by treadmill exercise A70-38361
- I
- IAKIMOV, N.  
Retinal images smearing during voluntary saccadic  
eye movements, obtaining thresholds for  
horizontal and vertical stimuli bands A70-38927
- Visual suppression linear dependence on angular  
size of voluntary saccadic eye movements,  
observing percentage of trials for stimulus  
perception A70-38928
- Temporal and spatial distribution of visual  
suppression during voluntary saccadic eye  
movement on different places of retina A70-38929
- IAKOVLEVA, E. V.  
Astronauts medical examination, using thermal load  
as functional and diagnostic test A70-40195
- IAKOVLEVA, L. A.  
Circulating blood volume and heart minute and  
stroke volumes in rabbits, using isotope-labeled  
albumin A70-38724
- IAMPIETRO, P. F.  
High temperature effects on performance of complex  
tasks by senior pilots  
[AD-703632] N70-35090
- IAROSHENKO, G. L.  
Medical support for long space missions based on  
space crews morbidity prediction, discussing  
onboard equipment and astronaut training A70-40194
- ILIN, A. V.  
Microwave radiation effects on maintenance  
personnel, investigating respiratory reaction,  
attention concentration, blood content of K, Ca,  
Na and proteins, etc A70-40289
- ILIUKHIN, A. V.  
Simulated space flight radiation effects on dogs  
DNA synthesis and bone marrow cell  
differentiation A70-40191
- IUREV, S. A.  
Intracellular myocardium potentials under vagus  
inhibition by electrometric DC amplifiers with  
positive and negative feedback A70-38213
- IUSHMANOVA-RAKOVA, A. V.  
Intracellular myocardium potentials under vagus

inhibition by electrometric DC amplifiers with  
positive and negative feedback A70-38213

## J

- JENNINGS, A. E.  
High temperature effects on performance of complex  
tasks by senior pilots  
[AD-703632] N70-35090
- JERISON, H. J.  
Human vigilance paradigm and physiology,  
discussing relationships between vigilance,  
signal detection and animal discrimination A70-38324
- JOHNSTON, R. S.  
Shock absorbing couch for body support under high  
acceleration or deceleration forces  
[NASA-CASE-XMS-01240] N70-35152
- JOLLEY, O. B.  
Evaluation of integrated contact-instrument  
concept for Army fixed wing flight instruction  
[AD-703161] N70-36454
- JONES, A. E.  
Literature search with abstracts on visual  
performance standards for selection and  
retention of astronauts  
[NASA-CR-108587] N70-36362
- JURIST, J. M.  
Ulnar resonant frequency reproducibility as  
objective measure of skeletal status, discussing  
forearm and hand positioning effect A70-39432

## K

- KAHNEMAN, D.  
Optimum attention allocation, discussing  
distraction resistance and multiple task  
performance A70-38316
- KAKURIN, L. I.  
Medical monitoring system onboard Soyuz  
spacecraft, describing equipment design, data  
acquisition and analysis, telemetric recordings,  
etc A70-40193
- KALANDAROVA, M. P.  
Proton irradiation effects on dogs with partial  
body protection A70-40192
- KAMLET, A. S.  
Bibliography on reaction time in human information  
processing tasks  
[AD-703857] N70-35375
- KAMSHILOV, M. M.  
Abiogenesis and effect of ultraviolet radiation on  
one-celled organisms  
[NASA-TT-F-13188] N70-37502
- KAPLANSKII, A. S.  
Mice immunobiological reactivity at simulated high  
altitude A70-40189
- KASERMAN, D. R.  
Cardiovascular stress testing using posterior  
bipolar lead for radiotelemetry monitoring A70-39199
- KATCHALSKY, A.  
Physical characteristics of synthetic and nerve  
membranes  
[AD-698816] N70-36431
- KAUFMAN, W. C.  
Ambient near vacuum pressure effect on blood  
circulation, examining thoracic aorta blood  
flow, pressures, gas expansion and water  
vaporization A70-40326
- KAUFMANN, E.  
He-Ne laser beam hazard to human retina A70-38309
- KAY, H.  
Linguistic competence of languages and performance  
grammars in machine conversation  
[P-4391] N70-36107
- KAZARIAN, L. E.  
Macroscopic architectural changes of cancellous  
and cortical bone in Rhesus monkey following  
long term immobilization and chemical removal of  
calcium

- KEATINGE, W. R. A70-38983  
Book on survival in cold water covering physiology and treatment of immersion hypothermia and drowning, thermoregulation, etc
- KEESEY, J. C. A70-37977  
Human electric shock hazards - bibliographies [AD-705067] N70-36575
- KEMPER, W. S. A70-39370  
Radio telemetry measurements of blood pressure and flow in unrestrained animals
- KENYON, E. M. A70-37747  
Microwave feeding system for heating and cooking prepackaged meals during extended space missions
- KHILOV, K. L. A70-37406  
Soviet book on peripheral vestibular apparatus and higher nervous system roles in motion sickness covering Coriolis acceleration tests, pilot training and selection, drugs, etc
- KHODZHAVA, Z. I. A70-39764  
Imaginary axes effect of phenomenal space in contrast illusions of distance, discussing division of S field of vision by definite point fixation
- KIESS, H. O. A70-39675  
Body surface cooling level and rate effects on psychomotor performance tested at various levels of mean weighted skin temperature /MWST/
- KINSMAN, R. A. A70-40025  
Acute mountain sickness symptomatology and cognitive performance, using standardized General High Altitude Questionnaire
- KIRALY, R. J. N70-36956  
Manned testing of flight breadboard oxygen system [NASA-CR-73395] N70-36933
- KIRILENKO, IU. I. N70-37846  
Vestibular and optokinetic stimulation effects on work capacity and reliability of human control operator in flying vehicle
- KIRKSEY, C. L. A70-37846  
Human brain LF activity in visual evoked response, determining relationship to stimulation
- KISHKO, YA. G. N70-36232  
Bacteriological research in high atmospheric layers for microorganisms [AD-703889]
- KLEIN, R. H. A70-39532  
Pilot scanning dwell times and control workload in simulated instrument approach, using eye-point-of-regard /EPR/ measurements [AIAA PAPER 70-999]
- KLEINHANSS, G. A70-37389  
Decreased mental and physical performance of human beings due to T-oral and placebo vaccine reactions
- KLEMENT, A. W., JR. N70-37128  
Bibliography on natural environmental radioactivity [WASH-1061-SUPPL]
- KLIOW, P. M. N70-36211  
Hepatic subcellular effects of altered atmospheres [AD-705220]
- KNOOP, P. A. N70-36244  
Adaptive mathematical model development for deriving automated pilot performance measurement techniques [AD-704597]
- KODAMA, A. M. A70-40333  
Macaca nemestrina total body water measurement by dilution technique
- KOGURE, K. A70-40330  
Hypoxia effects on cerebral blood flow in anesthetized dogs, considering acidosis and vasodilation
- KOHLER, R. C.  
Mission training program for Apollo Lunar Landing Mission
- [NASA-TM-X-65078] N70-35826  
Crew training program for lunar module thermal vacuum testing
- [NASA-TM-X-65082] N70-35857  
KOLIN, A.  
Electromagnetic blood flowmeters for circulatory research A70-39371
- KOLPAKOV, M. G. N70-34996  
Aldosterone effect on hemodynamics of dogs under restricted movement in cages
- KOROLKOV, V. I. A70-40185  
Orthostatic tolerance increase in animals by application of hyperoxic and hypercapnic gas mixtures
- KOVROV, B. G. A70-40184  
Life support systems based on Chlorella-bacterial culture, investigating water exchange and reclamation
- KOZHARINOV, V. I. A70-40193  
Medical monitoring system onboard Soyuz spacecraft, describing equipment design, data acquisition and analysis, telemetric recordings, etc
- KOZLOV, A. N. A70-40199  
Ultrasonic nonsearch Doppler cardiography for cycle phase analysis, recording single functions
- Electrolyteless ultrasonic Doppler biotelemetry cardiography system N70-35004
- KOZLOVA, V. I. A70-40174  
Skeletal muscles static tension influence on dog respiratory center functional properties, showing increased frequency volume and sensitivity under stimulation
- KOZYREVSAYA, G. I. N70-35002  
Mineral and water metabolism in humans after exposure to transverse acceleration
- KRAFT, I. A. A70-39166  
Circadian rhythms from electrocardiogram and cardiogram of patient with human heart transplant, noting P waves relationship between donor and recipient tissues
- KRAMPITZ, G. A70-38992  
Cells chemical origin, discussing terrestrial fractionation, amino acids, macromolecules, metabolism, etc
- KRASNITSKII, V. S. A70-38964  
Flight training quality prediction by multidimensional regression analysis, discussing relationship to candidates psychophysiological examinations
- KRIPKE, D. F. A70-38990  
Human sleep pattern changes due to acute sleep-waking cycle reversal
- KRIVENKO, V. N. A70-40289  
Microwave radiation effects on maintenance personnel, investigating respiratory reaction, attention concentration, blood content of K, Ca, Na and proteins, etc
- KULIK, A. M. N70-34993  
Carbon dioxide tension in arterial blood effects on rhythmic volley activity of respiratory neurons in medulla oblongata
- KULKARNI, S. A70-39625  
3-O-methyl-mannose neutral sugar identification as constituent of fungal polysaccharide
- KUPIRIANOV, A. A. A70-40291  
Oxygen pressure effects on tracking control training for stable reactions, investigating muscles bioelectrical activity changes during elevated pressure breathing
- KURILOVA, L. M.  
Thermal thermesthesiometer for skin heat



- sensibility studies  
A70-37806
- KUZMINA, R. I.  
Life support systems based on Chlorella-bacterial culture, investigating water exchange and reclamation  
A70-40184
- KUZNETS, E. I.  
Astronauts medical examination, using thermal load as functional and diagnostic test  
A70-40195
- KUZNETSOV, O. N.  
Psychological effects of assigning unexpected tasks to operator in simulated space flight environment  
N70-35000
- L
- LAIBLE, N.  
Effectiveness of thermoradiation sterilization of spacecraft hardware  
[NASA-CR-109972]  
N70-35167
- LARGE, P. J.  
Endogenous metabolism and survival of non-spore forming anaerobic bacteria under starving conditions  
[AD-703930]  
N70-36272
- LEACHMAN, R. D.  
Circadian rhythms from electrocardiogram and cardiograph of patient with human heart transplant, noting P waves relationship between donor and recipient tissues  
A70-39166
- LEADER, R. E.  
Display/control technology for high performance input/output between man and machine, describing man-in-loop simulation  
A70-37875
- LEBEDEV, N. F.  
Darkness adaptation of flight personnel in polar regions, discussing effects of physical and nervous strain, sickness and alcoholic intoxication  
A70-40290
- LECOCQ, F. R.  
Human gluco-regulatory hormone reserve depressions following acute and chronic acceleration exposure  
A70-39436
- LEDERBERG, J.  
Cytochemical studies of planetary microorganisms and explorations in exobiology  
[NASA-CR-112847]  
N70-37403
- LEDWITH, P.  
Choice reaction and movement time dependence on hypoxia induced by air pressure reduction inside decompression chamber, discussing adult human performance  
A70-39714
- LEHTIOE, P. K.  
Component decision logical and temporal arrangement in visual search, defining target by several attribute value combination  
A70-38314
- LETUNOVA, S. V.  
Chemical reduction capacity of various microflora found in silt and soil deposits from different biochemical regions  
[NASA-TT-P-13197]  
N70-36013
- LEVEENE, J. E.  
Literature search with abstracts on visual performance standards for selection and retention of astronauts  
[NASA-CR-108587]  
N70-36362
- LEVERETT, S. D.  
Human gluco-regulatory hormone reserve depressions following acute and chronic acceleration exposure  
A70-39436
- LEVY, P. S.  
Estimation of microbial release probabilities from Martian lander  
N70-35044
- LIBERT, J. E.  
Data acquisition for confined groups of humans  
[AD-705066]  
N70-36574
- LIDDELL, J. J.  
Performance of Apollo sea dye marking powder  
[NASA-TM-X-65045]  
N70-35724
- LINDE, L. H.  
Pulmonary hypertension in congenital heart diseases as function of blood flow  
A70-39367
- LINDELL, K. F.  
Effectiveness of thermoradiation sterilization of spacecraft hardware  
[NASA-CR-109972]  
N70-35167
- LIPMAN, R. L.  
Human gluco-regulatory hormone reserve depressions following acute and chronic acceleration exposure  
A70-39436
- LIPSCOMB, H. S.  
Circadian rhythms from electrocardiogram and cardiograph of patient with human heart transplant, noting P waves relationship between donor and recipient tissues  
A70-39166
- LISHCHUK, V. A.  
Soviet book on isolated animal heart autoregulation, considering cardio-pulmonary preparations, functional capacity, biometrics and computer technology for heart activity simulation models  
A70-37404
- LISOVSKII, G. M.  
Life support systems based on Chlorella-bacterial culture, investigating water exchange and reclamation  
A70-40184
- LISOV, I. L.  
Soviet book on isolated animal heart autoregulation, considering cardio-pulmonary preparations, functional capacity, biometrics and computer technology for heart activity simulation models  
A70-37404
- LITVIN, G. S.  
Peripheral vasculocapillary blood circulation by television UV capillaroscopy and electronic finger plethysmography  
A70-38212
- LOCKER, A.  
Psychotropic drugs radioprotective effects in mice, noting oxygen consumption and body temperature decrease after X ray exposure  
A70-37558
- LOCKHART, J. M.  
Body surface cooling level and rate effects on psychomotor performance tested at various levels of mean weighted skin temperature /MWSST/  
A70-39675
- LOCKHEAD, G. R.  
Object identification and form of multidimensional discrimination space, using locus stimulus model  
A70-38051
- LOEB, M.  
Human monitoring behavior, discussing display, task and organismic variables effects  
A70-38323
- LOGSDON, D. F., JR.  
External measurement of Fe-59 ferrokinetics  
[AD-705046]  
N70-36467
- LONSDORFER, J.  
Exhaled alveolar air data acquisition using mass spectrometer and multichannel analyzer  
A70-37356
- LORENTZEN, P. V.  
Human peripheral blood flow rewarming in cold ambient temperature, examining skin, rectal and tympanic membrane and oxygen uptake  
A70-40327
- LOWE, E. P.  
3-O-methyl-mannose neutral sugar identification as constituent of fungal polysaccharide  
A70-39625
- LUCAS, A.  
Distorting and distorted components during geometrical illusions stereoscopic registration  
A70-38926
- LUCK, T. J.  
Uncoated quartz twin crystal microbalance for monitoring water vapor content of respiratory gases  
A70-37844
- LUEER, G.  
Interindividual differences in judging stimulus

- similarities, explaining unsatisfactory results obtained by average scalings A70-38506
- LUNEV, I. IA.  
Orthostatic tolerance increase in animals by application of hyperoxic and hypercapnic gas mixtures A70-40185
- LYON, C. J.  
Auxin downward transport by gravity in leaves, examining ethylene inhibition A70-39234
- M**
- MACKENTHUN, K. M.  
Biological field investigative techniques and practices of water pollution N70-36149
- MAKAROV, G. P.  
Atmospheric composition cyclic changes effects on human basal metabolism under hypokinesia A70-40197
- MALONEY, J. E.  
Dynamic intravascular pressures measured in small vessels of frog lung using micropressure transducer inserted into vessel lumen A70-38368
- MANOCHA, S. L.  
Acetylcholinesterase and simple esterases distribution in squirrel monkey brain, examining activity in neuropil and postrema area neurons A70-38993
- HANUILOV, I. A.  
Blood vessels constriction in rear limbs, small intestine and spleen of dog with arterial blood heated above rectal temperature A70-40173
- MARGARIA, R.  
Heart stroke volume estimation at submaximal exercise using blood hemoglobin content and heart rate A70-40328
- MARKLEY, R. P.  
Space simulator to produce visual properties of objects outside earth atmosphere and determine distance and rate perception [NASA-CR-112843] N70-37467
- MARKOVSKAYA, G. I.  
Myocardial contractile function in rats under acute overstrain, evaluating role of preliminary training to altitude hypoxia A70-37805
- MATEEV, ST.  
Retinal images smearing during voluntary saccadic eye movements, obtaining thresholds for horizontal and vertical stimuli bands A70-38927  
Visual suppression linear dependence on angular size of voluntary saccadic eye movements, observing percentage of trials for stimulus perception A70-38928  
Temporal and spatial distribution of visual suppression during voluntary saccadic eye movement on different places of retina A70-38929
- MAYZNER, M. S.  
Evoked potentials and visual information processing [AD-703330] N70-35504
- MAZAURY, E.  
Treating radioactive contamination of human organism by using tritiated water [CEA-R-3974] N70-37111
- MC CONVILLE, J. T.  
Weight, volume, and center of mass of segments of human body [NASA-CR-112672] N70-36813
- MC KIBBEN, D.  
Heat stress effects on cellular structure and function [AD-705654] N70-36418
- MCCALLISTER, B. D.  
Electrocardiogram vs vectorcardiogram for myocardial infarction diagnosis A70-38362
- MCCANN, J. P.  
Sinusoidal vibrations effects on rats at different air pressures, discussing human vibration tolerances and resonant frequencies of thoraco-abdominal system A70-39434
- MCCONAHAY, D. R.  
Electrocardiogram vs vectorcardiogram for myocardial infarction diagnosis A70-38362
- MCELVAIN, W. H.  
Air transportation of respiratory failure patients, considering medical equipment adaptation for aircraft use A70-39440
- MCGRATH, J. J.  
Myocardial Na and K content of rats exposed to high altitude, preparing isolated right ventricular strip A70-40541
- MCGREGOR, P.  
Human sleep pattern changes due to acute sleep-waking cycle reversal A70-38990
- MCHULLEN, B.  
Vacuum distillation vapor filtered catalytic oxidation for water reclamation from human waste, using radioisotopes for thermal energy A70-39437
- MECHALI, D.  
Radioactive contamination of human body bone marrow by strontium 90 as function of age and radiation dosage times [CEA-R-3952] N70-36993
- MEGEMONT, C.  
Stability of new compounds derived from uracil and thiouracil after gamma ray irradiation [CEA-R-3962] N70-37080
- MEISTER, D.  
Tests and test techniques for human performance prediction in man-machine systems tasks [NASA-CR-1614] N70-35379
- MELIKADZE, N. L.  
Preliminary conversion of images in visual imaging identification system [AD-703380] N70-35362
- MENITSKII, D. N.  
Electroencephalography with automatic frequency analysis to simulate processes involving brain self regulation A70-38218
- MERCIER, J.  
Treating radioactive contamination of human organism by using tritiated water [CEA-R-3974] N70-37111
- METZGER, C. A.  
Vacuum distillation vapor filtered catalytic oxidation for water reclamation from human waste, using radioisotopes for thermal energy A70-39437
- MEUNIER-CARUS, J.  
Exhaled alveolar air data acquisition using mass spectrometer and multichannel analyzer A70-37356
- MEYERSON, F. Z.  
RNA concentration and protein synthesis in brain and memory retention under high altitude hypoxia stress N70-34997
- MIKALEVA, N. P.  
Fractional composition of skeletal muscle proteins in white rats during hypokinesia N70-34995
- MILLER, H. S., JR.  
Cerebral and symmetric vascular dynamics in response to stress [AD-701941] N70-36397
- MILLER, I. R.  
Physical characteristics of synthetic and nerve membranes [AD-698816] N70-36431
- MILLER, S.  
Literature search with abstracts on visual performance standards for selection and retention of astronauts [NASA-CR-108587] N70-36362
- MILLS, W. A.  
Epidemiologic and experimental studies of radiation bio-effects [PB-190110] N70-37320

## MILOV, IU. I.

Hypokinesia effects on rats protein synthesis rates, determining body and organ weights, muscle tissue nitrogen content and transaminase activity

A70-40187

## MION, C.

Treating radioactive contamination of human organism by using tritiated water  
[CEA-R-3974]

N70-37111

## MIQUEL, J.

Senescent *Drosophila melanogaster* flight muscle electron microscopic examination showing mitochondria in stages of degeneration

A70-40075

## MIROUZE, J.

Treating radioactive contamination of human organism by using tritiated water  
[CEA-R-3974]

N70-37111

## MITCHELL, J. H.

Cardiac ventricular function in compression pump terms, relating mechanical activity to end-diastolic fiber length

A70-39364

## MITIUSHOV, V. M.

Human respiration activity measurement in pressure chamber with different pressures and mixture compositions by spirograph equipment

A70-40175

## MITRANI, L.

Retinal images smearing during voluntary saccadic eye movements, obtaining thresholds for horizontal and vertical stimuli bands

A70-38927

Visual suppression linear dependence on angular size of voluntary saccadic eye movements, observing percentage of trials for stimulus perception

A70-38928

Temporal and spatial distribution of visual suppression during voluntary saccadic eye movement on different places of retina

A70-38929

## MOLNAR, P.

Desynchronized sleep phase in cats, discussing activation and hippocampal theta and hippocampal delta rhythm predominance stages

A70-40171

## MONING, H. R.

Topological characteristics effects on stereoscopic perception  
[DISS-4259]

N70-36394

## MONOSH, E.

Cardiovascular blood circulation system dynamic characteristics analysis by linear statistical correlation methods, describing test for determining weighting function

A70-39905

## MORAN, W. H., JR.

Changing gravity and weightlessness effects on vasopressin control systems, with immunochemical and biological assay studies  
[NASA-CR-112358]

N70-36764

## MORAY, N.

Attention theory experimental design logic, discussing quantitative theory

A70-38315

## MOROKHOVA, N. I.

Lung alveolar and capillary wall structure in mammals under normal conditions, transverse acceleration and mechanically changed pulmonary circulation

A70-40190

## MOROZOVA, R. S.

Lung alveolar and capillary wall structure in mammals under normal conditions, transverse acceleration and mechanically changed pulmonary circulation

A70-40190

## MORRISON, J. B.

Muscle function mechanics across knee joint in walking, relating tension to length, velocity and energy absorption

A70-37810

## MORTON, J. G.

Endogenous metabolism and survival of non-spore forming anaerobic bacteria under starving conditions  
[AD-703930]

N70-36272

## MOSUR, A. I.

Darkness adaptation of flight personnel in polar regions, discussing effects of physical and nervous strain, sickness and alcoholic intoxication

A70-40290

## HUCKLER, F. A.

Tests and test techniques for human performance prediction in man-machine systems tasks  
[NASA-CR-1614]

N70-35379

## HUELLER, G.

Cells chemical origin, discussing terrestrial fractionation, amino acids, macromolecules, metabolism, etc

A70-38992

## HULLINS, C. B.

Cardiac ventricular function in compression pump terms, relating mechanical activity to end-diastolic fiber length

A70-39364

## HURDEN, S.

Endogenous metabolism and survival of non-spore forming anaerobic bacteria under starving conditions  
[AD-703930]

N70-36272

## MUSACCHIA, X. J.

Low ambient temperature exposure effect on hamster intestinal absorption capacity, using glucose test compound

A70-37772

## N

## NAATANEN, R.

Enhanced evoked potentials sited by auditory stimuli in complex task, considering EEG and neurophysiological basis of selective attention

A70-38318

## NACHEV, CH.

Cardiac rhythm, respiration and rhythmical processes of alimentary tract, using digital data device

A70-38214

## NANEISHVILI, T. L.

Desynchronized sleep phase in cats, discussing activation and hippocampal theta and hippocampal delta rhythm predominance stages

A70-40171

## NEFEDOV, IU. G.

Medical monitoring system onboard Soyuz spacecraft, describing equipment design, data acquisition and analysis, telemetric recordings, etc

A70-40193

## NEUSTADTER, A.

Air quality control standards for New Jersey, New York, and Connecticut  
[PB-191389]

N70-37519

## NEVSKAIA, G. P.

Proton irradiation effects on dogs with partial body protection

A70-40192

## NEW, A. E.

Anthropometric determinations of American born *Macaca mulatta* for orbiting primate experiment  
[AD-700907]

N70-36495

## NICKERSON, R. S.

Human response time to visual stimulus preceding or following auditory stimulus as function of interstimulus interval

A70-38311

## NIDEKKER, I. G.

Cardiac contraction rhythm autocorrelation and spectral analysis in healthy subjects and patients with disturbed sinus node functional states

A70-38963

## NOGEIRE, C.

Human sleep pattern changes due to acute sleep-waking cycle reversal

A70-38990

## NORMAN, D. A.

Human memory information structure, discussing pattern recognition, simultaneous attention, problem solving and logic

A70-38322

O

- OBERMAYER, R. W.  
Tests and test techniques for human performance prediction in man-machine systems tasks  
[NASA-CR-1614] N70-35379
- OBRIEN, W. F., JR.  
Multipurpose microminiature multichannel biomedical telemetry system, discussing design A70-37856
- ODIEVRE, M.  
Radioactive contamination of human body bone marrow by strontium 90 as function of age and radiation dosage times  
[CEA-R-3952] N70-36993
- OFORSAGD, P.  
Prolonged hyperbaric oxygen breathing effect on human physical performance at rest and during severe exercise A70-38369
- OHLBAUM, M. K.  
Hypoxia effects on aviators visual accommodation, convergence and stereoaquity, noting myopia increase with altitude A70-38996
- OKLADNIKOV, IU. N.  
Life support systems based on Chlorella-bacterial culture, investigating water exchange and reclamation A70-40184
- OLSHAK, V.  
Human body elastic properties effects on arterial pressure measurement by sphygmomanometer A70-39879
- ONEILL, W. D.  
Cat lens motion in response to ciliary ganglion step and sinusoidal stimulation, indicating damped accommodative system A70-38925
- ONIANI, T. N.  
Desynchronized sleep phase in cats, discussing activation and hippocampal theta and hippocampal delta rhythm predominance stages A70-40171
- OHO, N.  
Inflation tests of liferafts with CO<sub>2</sub> and N<sub>2</sub> at low temperatures N70-35262
- OSIPOV, I. S.  
Circulating blood volume and heart minute and stroke volumes in rabbits, using isotope-labeled albumin A70-38724
- OTTAVI, E.  
Mathematical methods for improving sharpness of scintigraphic images  
[CEA-R-3920] N70-37137
- PALETS, B. L.  
Soviet book on isolated animal heart autoregulation, considering cardio-pulmonary preparations, functional capacity, biometrics and computer technology for heart activity simulation models A70-37404
- PANKOVA, A. S.  
Prolonged transverse acceleration effects on rats kidney and posterior hypophysis neurosecretions A70-40188
- PAPPAS, N.  
Pulse coding system for average evoked EEG potential data acquisition and analysis, describing pulse generation circuitry and computer implemented logic A70-38985
- PARIN, V. V.  
Medicobiological approach to living conditions for sustained residence and human activity during prolonged space flights, describing sealed chamber experiment A70-37525
- PARKER, J. C.  
Murine viruses in germfree mice selected for extraterrestrial life testing of Apollo lunar samples  
[NASA-CR-108589] N70-36473

P

- PASECHNIK, O. F.  
Protein solutions and cell cultures changes by ruby and Nd lasers radiation, noting threshold energy A70-39419
- PATRICK, T.  
Prolonged hyperbaric oxygen breathing effect on human physical performance at rest and during severe exercise A70-38369
- PATSKINA, S. A.  
Soviet book on isolated animal heart autoregulation, considering cardio-pulmonary preparations, functional capacity, biometrics and computer technology for heart activity simulation models A70-37404
- PEARSONS, K. S.  
Temporal and spectra combination effects on aircraft sound judged noisiness, using human subjects in anechoic chamber A70-39712
- PEEPLES, D. R.  
Eye movements during visual search and meaningless pattern discrimination A70-38054
- PERCHERSKY, J.  
Heat stress effects on cellular structure and function  
[AD-705654] N70-36418
- PERKINS, E. F.  
Development of nylon-linen webbing material for restraint harness in Apollo spacecraft  
[NASA-TM-X-64437] N70-35661
- PERKINS, G. F.  
Hyperbaric oxygen exposure produced hypertension and pulmonary edema, discussing carbon dioxide transport mechanism in blood A70-39430
- PERRY, N. W., JR.  
Human spatio-temporal visual evoked response characteristics, showing potential gradient rotation in same period as input stimulus A70-37845
- Human brain LF activity in visual evoked response, determining relationship to stimulation A70-37846
- PERRY, R. F.  
Research in visual perception for carrier landing  
[AD-706036] N70-36480
- PESHAN, G. J.  
Shock absorbing couch for body support under high acceleration or deceleration forces  
[NASA-CASE-XMS-01240] N70-35152
- PETROV, L.  
Perfusion peristaltic pump for determining smooth muscle reaction in vascular bed, discussing applications to physiological and pharmacological investigations A70-38958
- PETROVA, G. M.  
Dispersion pattern of aerosol particles in free atmosphere  
[AD-702332] N70-35421
- PETRUNINA, N. S.  
Geochemical ecology of plants  
[NASA-TT-F-13198] N70-36133
- PHILPOTT, D. E.  
Senescent Drosophila melanogaster flight muscle electron microscopic examination showing mitochondria in stages of degeneration A70-40075
- PIGGINS, D. J.  
Geometrical figure fragmentation produced by intermittent illumination, examining dependence on presentation frequency and temporal factors A70-39491
- PINDAK, F. F.  
Hypobaric hypoxia effects on MM virus infection resistance in mice A70-39428
- PINSKER, I. SH.  
Electrocardiography leads system optimal selection based on electrophysical modeling A70-38207
- Electric dipole displacement of heart estimation by supplementing orthogonal with precordial lead, discussing stationary and moving point dipole hypotheses

- PIRAGES, S. A70-38209  
Mongrel dogs pulmonary and systemic circulatory responses to dopamine infusion
- PODYMOW, V. K. A70-38986  
Prolonged transverse acceleration effects on rats kidney and posterior hypophysis neurosecretions
- POHORECKY, L. A. A70-40188  
Lighting effects on phenylethanolamine-N-methyl-transferase /PNMT/ activity and adrenal epinephrine content in rats
- POPE, D. H. A70-38982  
Hydrostatic pressure effects on photosynthesis and growth of unicellular marine algae and diatoms [AD-704496] N70-36546
- POTANIN, C. A70-38361  
Cutaneous liquid crystal temperature sensors for thermographic patterns of angina pectoris induced by treadmill exercise
- POWELL, J. D. A70-38361  
Manned testing of flight breadboard oxygen system [NASA-CR-73395] N70-36933
- PRATT, A. J. A70-40326  
Ambient near vacuum pressure effect on blood circulation, examining thoracic aorta blood flow, pressures, gas expansion and water vaporization
- PRIBRAM, K. H. A70-37812  
Visual attention and temporal cortex stimulation effects on evoked electrical activity in monkey brain
- PRICE, D. F. A70-37812  
Breathing mask for Apollo command module spacecrew [NASA-TM-X-64441] N70-35728
- PROPHET, W. W. A70-36454  
Evaluation of integrated contact-instrument concept for Army fixed wing flight instruction [AD-703161] N70-36454
- PROVINS, K. A. A70-38053  
Heat stress effects on serial reaction time in subjects performing visual tasks
- PRUNKL, P. R. A70-34944  
Criteria for rating proficient performance of complex job in aviation combat situation [AD-703510] N70-34944
- PURDY, C. H. A70-39434  
Sinusoidal vibrations effects on rats at different air pressures, discussing human vibration tolerances and resonant frequencies of thoraco-abdominal system
- PUSHKIN, V. W. A70-37065  
Rheoencephalographic changes as indication of psychic stress

## R

- RABBITT, P. M. A. A70-38313  
Preliminary taxonomy for errors in serial, self-paced choice reaction time experiments, discussing speed-error tradeoff
- RADEV, KHR. A70-38214  
Cardiac rhythm, respiration and rhythmical processes of alimentary tract, using digital data device
- RADNOSKY, M. I. A70-34857  
Design of inflatable life raft for aircrafts and boats [NASA-CASE-XMS-00863] N70-34857  
Shock absorbing couch for body support under high acceleration or deceleration forces [NASA-CASE-XMS-01240] N70-35152  
Lightweight life preserver without fastening devices [NASA-CASE-XMS-00864] N70-36493
- RADZINSKAIA, M. V. A70-38206  
Soviet papers on physiological data collection and analysis methods

- READER, D. C. N70-36510  
Industrial safety harness assessment for aircraft serving personnel [FPRC/HEMO-246] N70-36510
- REEBEN, V. A. A70-38215  
Arterial pressure measurement by automatic control system based on external compression pressure for maximum amplitude intraarterial pressure pulse oscillations
- REEDER, L. A70-35826  
Mission training program for Apollo Lunar Landing Mission [NASA-TM-X-65078] N70-35826
- REIMANN, H. A. A70-38414  
Long rhythms of periodic disparate heritable diseases in man
- REINMUTH, O. M. A70-40330  
Hypoxia effects on cerebral blood flow in anesthetized dogs, considering acidosis and vasodilation
- RERBERG, M. S. A70-40184  
Life support systems based on Chlorella-bacterial culture, investigating water exchange and reclamation
- REYNOLDS, M. C. N70-35167  
Effectiveness of thermoradiation sterilization of spacecraft hardware [NASA-CR-109972] N70-35167
- RINALDI, P. C. A70-37747  
Microwave feeding system for heating and cooking prepackaged meals during extended space missions
- ROBISON, S. C. A70-38986  
Mongrel dogs pulmonary and systemic circulatory responses to dopamine infusion
- ROBISON, S. L. A70-38575  
Hemodynamic effect of lidocaine given by infusion and bolus injections in myocardial infarction, examining cardiac output, heart rate, systolic left ventricular and aortic pressures
- ROCKWELL, R. L. N70-36857  
Nonlinear analysis of pressure waves and shock waves in blood vessels [NASA-CR-112864] N70-36857
- ROGERS, E. E. N70-37224  
Rejection of arm prosthetic devices by children with congenital deformities [FR-1103-70] N70-37224
- ROGERS, J. G. A70-37564  
Real time analog display inputs for electronic computers and tracking in physiological control circuits, describing various manual controls
- ROGOZKIN, V. D. N70-34990  
Prolonged space flight simulation and irradiation effects on dogs treated with ATP and amytravir drugs
- ROGUSKII, S. S. A70-40289  
Microwave radiation effects on maintenance personnel, investigating respiratory reaction, attention concentration, blood content of K, Ca, Na and proteins, etc
- ROONEY, J. A. A70-39981  
Erythrocyte suspension subjected to gas bubble ultrasonic oscillation, investigating hemolysis mechanism
- ROSE, C. M. A70-38976  
Tyrosine content and utilization in mouse liver, showing daily rhythm in composite metabolism rate
- ROSS, J., JR. A70-39363  
Muscular mechanics of intact heart contraction, discussing effects of altered fiber length, afterload and inotropic state
- ROST, G. A. A70-39363  
Hypoxia warning systems using polarographic sensor and miniaturized electronics for face-mask and cabin installation for aircraft and spacecraft

- ROUGHTON, F. J. W. A70-39429  
Chloride ion shift of respiration occurring between plasma and erythrocytes as function of carbon dioxide, using rapid filtration method A70-38366
- ROUSSEAU, J. E., JR.  
Plasma tocopherol concentrations and vitamin E deficiency in dogs, noting pathologic changes in smooth muscle, central nervous system, skeletal muscle and retina A70-38991
- ROWE, G. T.  
Benthic biomass and animal densities under varying ecological conditions [NYO-3862-24] N70-35107
- ROZENBLAT, V. V.  
Dynamic radio telemetry in physiology and medicine, discussing recordable parameters, multichannel systems, automatic data processing, etc A70-38216
- ROZENSHTRAUKH, L. V.  
Intracellular myocardium potentials under vagus inhibition by electrometric DC amplifiers with positive and negative feedback A70-38213
- RUBIN, B.  
Repair of dental enamel using calcium phosphate gel [NASA-CASE-ERC-10338] N70-36053
- RYBAK, B.  
Axiomatic approach to homeostasis, discussing living systems as oscillators with input-output and transit variables in duration and elongation A70-38411
- S**
- SAKHAROV, D. A.  
Evolution of cholinergic mediatory process in mollusks [NASA-TT-F-13192] N70-36132
- SANDALOV, IU. A.  
Preliminary physical training for human water immersion resistance improvement A70-40196
- SANDERS, A. F.  
Attention and performance - Conference, Soesterberg, Netherlands, August 1969 A70-38310
- SANNERSTEDT, R.  
Human arterial hypertension, correlating ECG changes with systemic hemodynamics A70-40069
- SAPOV, I. A.  
Ship engineers cardiovascular system functional changes during HF internal combustion engine noise, investigating EKG recordings and arterial pressure A70-40292
- SAUNDERS, J. F., JR.  
Water management during flight of Apollo spacecraft [NASA-TN-X-64445] N70-35803  
Effect of cabin pressure on environmental control system [NASA-TN-X-65009] N70-35804
- SAVINA, E. A.  
Prolonged transverse acceleration effects on rats kidney and posterior hypophysis neurosecretions A70-40188
- SAVKIN, V. I.  
Chlorella cultivation productivity N70-34994
- SCHAFFNER, F.  
Hepatic subcellular effects of altered atmospheres [AD-705220] N70-36211
- SCHALKOWSKY, S.  
Estimation of microbial release probabilities from Martian lander N70-35044
- SCHEER, E.  
3-O-methyl-mannose neutral sugar identification as constituent of fungal polysaccharide A70-39625
- SCHENBERG, P.  
Hypoxia effects on cerebral blood flow in anesthetized dogs, considering acidosis and vasodilation A70-40330
- SCHELLE, H. W.  
Vacuum distillation vapor filtered catalytic oxidation for water reclamation from human waste, using radioisotopes for thermal energy A70-39437
- SCHIEBER, J.-P.  
Exhaled alveolar air data acquisition using mass spectrometer and multichannel analyzer A70-37356
- SCHIRMER, W.  
Auditory direction finding ability, discussing experimental arrangement, white noise production, test conduction and statistical evaluation A70-40538
- SCHMIDT, J. P.  
Hypobaric hypoxia effects on MM virus infection resistance in mice A70-39428  
Systemic bacterial infection resistance in white mice exposed to simulated hypobaric normoxic space cabin environment A70-39431
- SCHMIDT, K. J.  
Radiation dosage of Tc 99 iron/II/ complex for brain tumors [LIB/TRANS-237] N70-37581
- SCHNURE, J. J.  
Human gluco-regulatory hormone reserve depressions following acute and chronic acceleration exposure A70-39436
- SCHOLTHOLT, J.  
Liver blood flow in dogs during increased oxygen consumption A70-40448
- SCHROLL, M.  
Hemodynamic effect of lidocaine given by infusion and bolus injections in myocardial infarction, examining cardiac output, heart rate, systolic left ventricular and aortic pressures A70-38575
- SCHULER, A. R.  
Adaptive mathematical model development for deriving automated pilot performance measurement techniques [AD-704597] N70-36244
- SCHULTZ, D. C.  
Water immersion for weightlessness simulation in astronaut training [NASA-TN-X-64428] N70-35749
- SECKBACH, J.  
Unicellular hot spring acidophilic alga Cyanidium cadarium cultured in pure carbon dioxide, examining packed cell volume, oxygen production and growth rate A70-39492
- SELVESTER, R. H.  
Digital computer model of total body ECG surface maps, simulating male torso with lungs A70-39369
- SEREDA, N. G.  
Human body radioactive nuclides in vivo quantitative analysis by gamma ray spectra, considering matrix method accuracy A70-40449
- SERGIENKO, A. V.  
Hypoxia and high ambient temperature effects on altitude tolerance in animals A70-40186
- SHAKIN, V. V.  
Electric dipole displacement of heart estimation by supplementing orthogonal with precordial lead, discussing stationary and moving point dipole hypotheses A70-38209
- SHEFFIELD, L. T.  
Cutaneous liquid crystal temperature sensors for thermographic patterns of angina pectoris induced by treadmill exercise A70-38361
- SHEWHAKE, G. A.  
Design of inflatable life raft for aircrafts and boats [NASA-CASE-XMS-00863] N70-34857  
Lightweight life preserver without fastening devices



- [NASA-CASE-XMS-00864] N70-36493  
 SHICHKO, G. A.  
 Soviet monograph on secondary signaling system  
 role in development of speech, thought,  
 conditioned and unconditioned reflexes, human  
 will and hypnosis, noting salivary gland  
 function A70-37407
- SHISHKO, E. D.  
 Protein solutions and cell cultures changes by  
 ruby and Nd lasers radiation, noting threshold  
 energy A70-39419
- SHORT, L. L.  
 Sinusoidal vibrations effects on rats at different  
 air pressures, discussing human vibration  
 tolerances and resonant frequencies of thoraco-  
 abdominal system A70-39434
- SHUGARMAN, P. M.  
 Unicellular hot spring acidophilic alga *Cyanidium*  
*cadarium* cultured in pure carbon dioxide,  
 examining packed cell volume, oxygen production  
 and growth rate A70-39492
- SIDORENKO, G. I.  
 Ballistocardiogram autocorrelation function and  
 spectrum by scanning graph decoder and computer,  
 determining total power, harmonics periodicity  
 and energy concentration A70-38211
- SIEGEL, B. Z.  
 Anomalous substrate oxidizing specificities among  
 red brown and green algal peroxidases and land  
 plants A70-37773
- SIEGEL, S. M.  
 Anomalous substrate oxidizing specificities among  
 red brown and green algal peroxidases and land  
 plants A70-37773
- Ca ion reversible effects of hydrochloric acid and  
 ammonia water on betacyanin leakage from  
 beetroot sections A70-38375
- SIMMONS, D. H.  
 Pulmonary hypertension in congenital heart  
 diseases as function of blood flow A70-39367
- SIMONOV, E. E.  
 Hypokinesia effects on rats protein synthesis  
 rates, determining body and organ weights,  
 muscle tissue nitrogen content and transaminase  
 activity A70-40187
- SIUCH, B.  
 Cardiovascular blood circulation system dynamic  
 characteristics analysis by linear statistical  
 correlation methods, describing test for  
 determining weighting function A70-39905
- SKLAVENITIS, H.  
 Computer programs for fast neutron thermalization,  
 thermal neutron scattering, and gamma radiation  
 damage [CEA-R-3994] N70-37113
- SLUMP, P.  
 Sterilization and storage effects on nutritional  
 value of canned foods [R-3092] N70-35577
- SMIRNOV, K. V.  
 Absorption, distribution, and elimination of  
 glycine by rats after exposure to hypoxia N70-34998
- SMITH, D. B. D.  
 EEG analysis for poststimulus events, examining  
 contingent negative variation and late positive  
 wave of average evoked potential A70-37813
- SMITH, K. U.  
 Steering behavior during learning as function of  
 self generated stimuli by movement compared with  
 stimulus tracking A70-39674
- SMITH, R. E.  
 Electrocardiogram vs vectorcardiogram for  
 myocardial infarction diagnosis A70-38362
- SMITH, S.  
 Data acquisition for confined groups of humans  
 [AD-705066] N70-36574
- SMORODIN, N. F.  
 Ship engineers cardiovascular system functional  
 changes during HF internal combustion engine  
 noise, investigating EKG recordings and arterial  
 pressure A70-40292
- SNETKOV, V. I.  
 Rat neuron impulsive reactions and frequency  
 response differences to varying sound signals,  
 discussing time constant, signal intensity and  
 frequencies A70-40172
- SNOW, E. B.  
 Philosophy and technology of unmanned spacecraft  
 sterilization and planetary quarantine  
 [NASA-TM-X-53884] N70-37461
- SOLLBERGER, A.  
 Statistical analysis of short periodic time series  
 in biological rhythms including cosinor,  
 periodic regression, harmonic and  
 synchronization analyses A70-38412
- SOLOMON, J. C.  
 Digital computer model of total body ECG surface  
 maps, simulating male torso with lungs A70-39369
- SONNENBLICK, E. H.  
 Muscular mechanics of intact heart contraction,  
 discussing effects of altered fiber length,  
 afterload and inotropic state A70-39363
- SOPRUNOV, F. F.  
 Evolution trends of carbohydrate metabolism in  
 invertebrates [NASA-TT-F-13190] N70-37490
- SPACH, H. S.  
 Isopotential surface maps for body surface  
 potential relation to ECG and Frank  
 vectorcardiogram during QRS stages in children A70-39368
- SPINELLI, D. N.  
 Visual attention and temporal cortex stimulation  
 effects on evoked electrical activity in monkey  
 brain A70-37812
- STAMM, W. E.  
 Lighting effects on phenylethanolamine-N-methyl-  
 transferase /PNMT/ activity and adrenal  
 epinephrine content in rats A70-38982
- STAMPER, D. A.  
 Acute mountain sickness symptomatology and  
 cognitive performance, using standardized  
 General High Altitude Questionnaire A70-40025
- STANSELL, M. J.  
 Portable battery operated system for rapid  
 measurements of blood plasma electrolytes during  
 aeromedical evacuation A70-39433
- STANSELL, S. J.  
 Portable battery operated system for rapid  
 measurements of blood plasma electrolytes during  
 aeromedical evacuation A70-39433
- STAVE, A. H.  
 Comfort plane switch mounting design for  
 helicopter collective controls, noting mock-up  
 evaluation by test pilots A70-38922
- STEGALL, H. F.  
 Ambient near vacuum pressure effect on blood  
 circulation, examining thoracic aorta blood  
 flow, pressures, gas expansion and water  
 vaporization A70-40326
- STOCKBRIDGE, H. C. W.  
 Radar consoles with various display components  
 under different illumination levels to determine  
 optimal operator performance, discussing push-  
 button design recommendations A70-39713
- STONE, H. L.  
 Ambient near vacuum pressure effect on blood  
 circulation, examining thoracic aorta blood  
 flow, pressures, gas expansion and water

- vaporization  
A70-40326
- STOWE, D. E.  
Frank orthogonal vectorcardiograms on humans during acceleration, using beat-by-beat real time analog-digital computer technique  
A70-39435
- STUNKARD, J. A.  
Systemic bacterial infection resistance in white mice exposed to simulated hypobaric normoxic space cabin environment  
A70-39431
- SUSSMAN, H. M.  
Steering behavior during learning as function of self generated stimuli by movement compared with stimulus tracking  
A70-39674
- SWAN, H. J. C.  
Pathophysiology of congenital heart disease - Conference, University of California, Los Angeles, July 1967  
A70-39361
- SY, M.  
Stability of new compounds derived from uracil and thioracil after gamma ray irradiation [CEA-R-3962]  
N70-37080

## T

- TABATA, T.  
Inflation tests of liferafts with CO<sub>2</sub> and N<sub>2</sub> at low temperatures  
N70-35262
- TAKAHASHI, A.  
Senescent Drosophila melanogaster flight muscle electron microscopic examination showing mitochondria in stages of degeneration  
A70-40075
- TAM, L. Q.  
Hydrostatic pressure effects on photosynthesis and growth of unicellular marine algae and diatoms [AD-704496]  
N70-36546
- TANNER, R. N.  
Breathing mask for Apollo command module spacecrew [NASA-TM-X-64441]  
N70-35728
- TAUNTON, J. E.  
Prolonged hyperbaric oxygen breathing effect on human physical performance at rest and during severe exercise  
A70-38369
- TENENBAUM, L. A.  
Diaphragmatic muscle reactions and pneumogram changes in rats immediately after air passage obstruction  
A70-37804
- TENNEY, S. M.  
Human sensory perception associated with breathing, comparing physical stimulus intensity with judgement of magnitude  
A70-38370
- TERAI, T.  
3-O-methyl-mannose neutral sugar identification as constituent of fungal polysaccharide  
A70-39625
- TEREKHOV, I. V.  
Stabilograph and support dynamograph based on amplitude modulation of carrier frequency for standing stability determination in humans  
A70-38220
- TERENTEV, V. G.  
Medical support for long space missions based on space crews morbidity prediction, discussing onboard equipment and astronaut training  
A70-40194
- TERJUNG, W. H.  
Human bioclimatology at high altitude, discussing energy balance in terms of net solar and terrestrial radiation balance in mountain area  
A70-37369
- TERSKOV, I. A.  
Life support systems based on Chlorella-bacterial culture, investigating water exchange and reclamation  
A70-40184
- THREATT, D.  
Frank orthogonal vectorcardiograms on humans during acceleration, using beat-by-beat real time analog-digital computer technique  
A70-39435
- TIBBITTS, T. W.  
Rhythmic rotational movements in unifoliate leaves of Phaseolus angularis Wight grown under continuous light conditions [NASA-CR-112848]  
N70-37398
- TIKHOMIROV, I. I.  
Thermal thermesthesiometer for skin heat sensibility studies  
A70-37806
- TINSLEY, J. H.  
Physiological correlates of vigilance performance in humans [AD-706054]  
N70-34976
- TISHCHENKO, M. I.  
HF ballistocardiograms resonance distortions correction, using electrical selective filters  
A70-38210
- Stabilograph and support dynamograph based on amplitude modulation of carrier frequency for standing stability determination in humans  
A70-38220
- TITOMIR, L. I.  
Electrocardiography leads system optimal selection based on electrophysical modeling  
A70-38207
- Electrocardiography electrical bridge type leads system based on potential quenching phenomenon, determining electric dipole displacement of heart in transverse plane of body  
A70-38208
- TRIGG, L. N.  
Serum growth hormone response to hypoglycemia in man following insulin administration, reviewing lumped parameter model  
A70-38006
- TROBAUGH, R. L.  
Stress effects of high noise levels on lower body negative pressure experiments [NASA-TN-D-5967]  
N70-37076
- TRUMBO, D.  
Performance and response organization as uncertainty and structure function in pursuit tracking tasks  
A70-38320
- TSANKOV, S.  
Perfusion peristaltic pump for determining smooth muscle reaction in vascular bed, discussing applications to physiological and pharmacological investigations  
A70-38958
- TSUKERMAN, B. M.  
Electrocardiography leads system optimal selection based on electrophysical modeling  
A70-38207
- TUNG, Y.  
Pressurized liquid waste feed system for water reclamation in weightless environment [NASA-CASE-LAR-10365-1]  
N70-35619

## U

- ULITSKII, L. A.  
Microwave radiation effects on maintenance personnel, investigating respiratory reaction, attention concentration, blood content of K, Ca, Na and proteins, etc  
A70-40289
- ULVEDAL, F.  
Human gluco-regulatory hormone reserve depressions following acute and chronic acceleration exposure  
A70-39436
- UPDIKE, O. L.  
Uncoated quartz twin crystal microbalance for monitoring water vapor content of respiratory gases  
A70-37844
- UTKIN, V. L.  
Electronic differentiator for physiological research, discussing electrical voltage derivatives reproduction, sensitivity, etc  
A70-38219

## V

- VAN BOCKEL, J. J.  
Crew training program for third manned Apollo mission [NASA-TM-X-65047]  
N70-35788

- VAN CITTERS, R. L.  
Visceral blood flow during exercise in sled dogs,  
testing hypothetical compensatory decrease as  
cardiovascular reserve for skeletal muscle by  
biotelemetry  
A70-39366  
Radio telemetry measurements of blood pressure and  
flow in unrestrained animals  
A70-39370
- VAN DER MIJLL DEKKER, L. P.  
Sterilization and storage effects on nutritional  
value of canned foods  
[R-3092]  
N70-35577
- VANDEN DRIESSCHE, T.  
Circadian rhythms in single cell animals,  
examining cell division, temperature and light  
effects  
A70-38410
- VARNAUSKAS, E.  
Human arterial hypertension, correlating ECG  
changes with systemic hemodynamics  
A70-40069
- VARTANIAN, I. A.  
Rat neuron impulsive reactions and frequency  
response differences to varying sound signals,  
discussing time constant, signal intensity and  
frequencies  
A70-40172
- VEGOROV, B. B.  
Otolithic weight changes and vestibular disorders  
during weightlessness  
N70-35003
- VEICSTEINAS, A.  
Heart stroke volume estimation at submaximal  
exercise using blood hemoglobin content and  
heart rate  
A70-40328
- VENEDIKTOV, A. B.  
Stabilograph and support dynamograph based on  
amplitude modulation of carrier frequency for  
standing stability determination in humans  
A70-38220
- VLEK, C. A. J.  
Psychological tests for ability to learn  
association between event and occurrence  
probability  
A70-38319
- VOGT, W. L.  
Performance of Apollo sea dye marking powder  
[NASA-TM-X-65045]  
N70-35724
- VOLOGDIN, A. G.  
Applying paleontological method of studying  
sedimentary deposits to investigation of  
earliest forms of life in northern Eurasia  
[NASA-TT-F-13189]  
N70-37473
- VOLOSHIN, V. G.  
Ultrasonic nonsearch Doppler cardiography for  
cycle phase analysis, recording single functions  
A70-40199
- VON GIERKE, H. E.  
Macroscopic architectural changes of cancellous  
and cortical bone in Rhesus monkey following  
long term immobilization and chemical removal of  
calcium  
A70-38983
- VON WRIGHT, J. H.  
Visual sensory storage item selection efficiency  
A70-38321
- VORBECK, D. W.  
Sinusoidal vibrations effects on rats at different  
air pressures, discussing human vibration  
tolerances and resonant frequencies of thoraco-  
abdominal system  
A70-39434
- VOROBYEV, YE. I.  
Physiological responses of Soyuz 6, 7, and 8  
astronauts  
N70-34999
- VYAS, S. H.  
Preliminary taxonomy for errors in serial, self-  
paced choice reaction time experiments,  
discussing speed-error tradeoff  
A70-38313
- WACHTEL, J.  
ATC personnel training at International ATC  
Academy, discussing objectives and syllabus  
A70-38650
- WAESSLER, H.  
Brightness contrast by human observer binocular  
matching, discussing neural networks models  
A70-38924
- WAHLBERG, J. L.  
Criteria for rating proficient performance of  
complex job in aviation combat situation  
[AD-703510]  
N70-34944
- WALDIN, A. M.  
Air traffic controller stress reduction,  
discussing work-rest intervals and various  
management and human factors  
A70-38647
- WARD, T. M.  
Crew training program for lunar module thermal  
vacuum testing  
[NASA-TM-X-65082]  
N70-35857
- WATKINS, R. D.  
Chart and printed material legibility in cockpits  
for pilots  
[AM-MEMO-27]  
N70-36861
- WATSON, W. W.  
Radio telemetry measurements of blood pressure and  
flow in unrestrained animals  
A70-39370
- WATTS, G. K.  
Ruby laser radiation injury relationship to  
position and number of energy absorbing pigment  
particles in iris  
A70-39425
- WEIR, D. H.  
Pilot scanning dwell times and control workload in  
simulated instrument approach, using  
eye-point-of-regard /EPR/ measurements  
[AIAA PAPER 70-999]  
A70-39532
- WEISH, P.  
Psychotropic drugs radioprotective effects in mice,  
noting oxygen consumption and body temperature  
decrease after X ray exposure  
A70-37558
- WEITZMAN, E. D.  
Human sleep pattern changes due to acute sleep-  
waking cycle reversal  
A70-38990  
Nocturnal headache relationship to REM sleep stage  
from EEG, EOG and EMG data  
A70-38994
- WENTHIN, H.  
Extracellular spontaneous sequences of action  
potentials of thalamic neurons during asphyxia  
in rats under artificial respiration  
A70-38306
- WHEAT, R. W.  
3-O-methyl-mannose neutral sugar identification  
as constituent of fungal polysaccharide  
A70-39625
- WIEGAND, D.  
Decreased mental and physical performance of human  
beings due to T-oral and placebo vaccine  
reactions  
A70-37389
- WIGERTZ, O.  
Athletes ventilation and heart rate dynamic  
responses to supine leg exercise with sinusoidal  
work load  
A70-40329
- WILLIAMS, M. J.  
Influences of visual angle and retinal speed on  
duration and intensity of illusory motion  
[AD-703634]  
N70-35354
- WILSON, E. M.  
Thermal electronic instrumentation applied to  
biological flows including blood flow, cardiac  
outputs and volumes  
A70-37843
- WINN, L. W.  
Pressurized liquid waste feed system for water  
reclamation in weightless environment  
[NASA-CASE-LAR-10365-1]  
N70-35619
- WINTROUB, B. U.  
Mongrel dogs pulmonary and systemic circulatory  
responses to dopamine infusion  
A70-38986
- WITT, H.  
Aptitude test validity taking into account  
selection board subjective decisions on pilot  
applicant acceptance  
A70-38507

W

PERSONAL AUTHOR INDEX

ZWISLOCKI, J. J.

- WOLFE, J. W.  
Adjustable headholder for semicircular canal  
caloric testing  
[AD-700738] N70-36435
- WOOD, C. D.  
Hyperbaric oxygen exposure produced hypertension  
and pulmonary edema, discussing carbon dioxide  
transport mechanism in blood A70-39430
- Antimotion sickness drugs evaluated for  
effectiveness under standardized stress  
conditions in slow rotation room A70-39439
- WRIGHT, R. H.  
Geographic orientation in air operations for  
military aircraft systems  
[AD-705021] N70-36457
- WURTMAN, R. J.  
Tyrosine content and utilization in mouse liver,  
showing daily rhythm in composite metabolism  
rate A70-38976
- Lighting effects on phenylethanolamine-N-methyl-  
transferase /PNMT/ activity and adrenal  
epinephrine content in rats A70-38982
- ZWISLOCKI, J. J.  
Temporal sensory integration and auditory and  
tactile thresholds  
[AD-703376] N70-35366

Y

- YATES, W. G.  
Variations in mechanical properties of canine  
abdominal vena cava  
[NASA-CR-112876] N70-37029
- YOUNG, D. R.  
Serum growth hormone response to hypoglycemia in  
man following insulin administration, reviewing  
lumped parameter model A70-38006
- Mathematical model of human pituitary gland  
mechanism controlling secretions of serum growth  
hormone in response to glucose deficiency A70-38995
- YOUNG, J. W.  
Weight, volume, and center of mass of segments of  
human body  
[NASA-CR-112672] N70-36813
- YOUNG, R. W.  
Sound level vs duration evaluated for noise  
exposure using different exchange rates  
[ASA PAPER FF2] A70-39125

Z

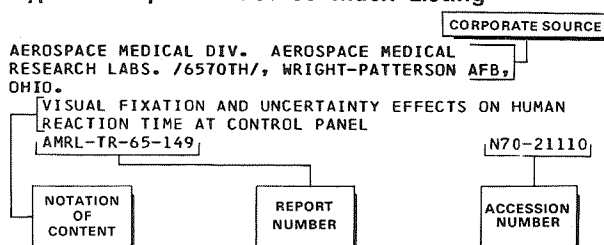
- ZAVIDSKII, E.  
Human body elastic properties effects on arterial  
pressure measurement by sphygmomanometer A70-39879
- ZAYTSEVA, G. N.  
Protein biosynthesis of various forms of soluble  
ribonucleic acids and aminoacyl RNA synthetases  
[NASA-TT-F-13186] N70-37531
- ZERENIN, A. G.  
Medical monitoring system onboard Soyuz  
spacecraft, describing equipment design, data  
acquisition and analysis, telemetric recordings,  
etc A70-40193
- ZLATORUNSKII, A. A.  
Medical monitoring system onboard Soyuz  
spacecraft, describing equipment design, data  
acquisition and analysis, telemetric recordings,  
etc A70-40193
- ZORILE, V. I.  
Oxygen pressure effects on tracking control  
training for stable reactions, investigating  
muscles bioelectrical activity changes during  
elevated pressure breathing A70-40291
- ZOULOUNIAN, P.  
Exhaled alveolar air data acquisition using mass  
spectrometer and multichannel analyzer A70-37356
- ZWIENER, U.  
Extracellular spontaneous sequences of action  
potentials of thalamic neurons during asphyxia  
in rats under artificial respiration A70-38306



# Corporate Source Index

AEROSPACE MEDICINE AND BIOLOGY / a continuing bibliography NOVEMBER 1970

## Typical Corporate Source Index Listing



The Notation of Content (NOC), rather than the title of the document, is used to provide a more exact description of the subject matter. The NASA or AIAA accession number is included in each entry to assist the user in locating the abstract in the abstract section of this supplement. If applicable, a report number is also included as an aid in identifying the document.

## A

- AEROSPACE MEDICAL DIV. AEROMEDICAL RESEARCH LAB. /6571ST/, HOLLAMAN AFB, N. MEX.**  
Measurement of head angular acceleration during impact  
[AD-704704] N70-36249
- AEROSPACE MEDICAL RESEARCH LABS., WRIGHT-PATTERSON AFB, OHIO.**  
Weight, volume, and center of mass of segments of human body  
[NASA-CR-112672] N70-36813
- AGENCE TUNISIENNE DE PUBLIC-RELATIONS, TUNIS.**  
Mechanisms controlling orientation of side roots and other plagiotropic plant parts in geotropic critical angle  
[NASA-TT-F-12639] N70-36014
- AIR FORCE SYSTEMS COMMAND, WRIGHT-PATTERSON AFB, OHIO.**  
Preliminary conversion of images in visual imaging identification system  
[AD-703380] N70-35362  
Dispersion pattern of aerosol particles in free atmosphere  
[AD-702332] N70-35421  
Bacteriological research in high atmospheric layers for microorganisms  
[AD-703889] N70-36232  
Statistical characteristics of images indicating forms  
[AD-700581] N70-36396  
Two methods for instructing classifier  
[AD-700806] N70-36500
- ARGONNE NATIONAL LAB., ILL.**  
Radiological physics report, including studies on radioelement toxicity, air pollution, Ce-137 fallout, and dosimetry  
[ANL-7615] N70-37435
- ARMY MEDICAL RESEARCH LAB., FORT KNOX, KY.**  
Fast retinal potential luminosity functions  
[AD-703178] N70-35314
- ATOMIC ENERGY COMMISSION RESEARCH ESTABLISHMENT, LUCAS HEIGHTS /AUSTRALIA/.**  
Radiation dosage of Tc 99 iron/II/ complex for brain tumors  
[LIB/TRANS-237] N70-37581
- ATOMIC ENERGY COMMISSION, LAS VEGAS, NEV.**  
Bibliography on natural environmental radioactivity  
[WASH-1061-SUPPL] N70-37128
- AVCO CORP., LOWELL, MASS.**  
Microorganism transport through small orifices in bio-barrier fluid flow

[NASA-CR-66703]

N70-35877

## B

- BUNKER-RAMO CORP., CANOGA PARK, CALIF.**  
Tests and test techniques for human performance prediction in man-machine systems tasks  
[NASA-CR-1614] N70-35379
- BUREAU OF RADIOLOGICAL HEALTH, ROCKVILLE, MD.**  
Epidemiologic and experimental studies of radiation bio-effects  
[PB-190110] N70-37320

## C

- CENTRAAL INSTITUUT VOOR VOEDINGSONDERZOEK TNO, ZEIST /NETHERLANDS/.**  
Sterilization and storage effects on nutritional value of canned foods  
[R-3092] N70-35577
- COMMISSARIAT A L ENERGIE ATOMIQUE, CADARACHE /FRANCE/.**  
Mathematical methods for improving sharpness of scintigraphic images  
[CEA-R-3920] N70-37137  
Bibliography of irradiated sugar and starch diet effects on mammals, microorganisms and insects  
[CEA-BIB-178] N70-37139
- COMMISSARIAT A L ENERGIE ATOMIQUE, FONTENAY-AUX-ROSES /FRANCE/.**  
Radioactive contamination of human body bone marrow by strontium 90 as function of age and radiation dosage times  
[CEA-R-3952] N70-36993  
Age factor and human tolerance to radioactive contamination of diets in different European regions by strontium 90 and cesium 137  
[CEA-R-3861] N70-37074  
Stability of new compounds derived from uracil and thioracil after gamma ray irradiation  
[CEA-R-3962] N70-37080  
Computer programs for fast neutron thermalization, thermal neutron scattering, and gamma radiation damage  
[CEA-R-3994] N70-37113
- COMMISSARIAT A L ENERGIE ATOMIQUE, GRENOBLE /FRANCE/.**  
Free radicals/radiation dosage linear relationship in alanine using electron paramagnetic resonance for biological tissue radiation damage study  
[CEA-R-3913] N70-36998  
Quantitative analysis of rare earth elements in plants using thermal neutron irradiation and chromatography  
[CEA-R-3917] N70-37015
- COMMISSARIAT A L ENERGIE ATOMIQUE, MARCOULE /FRANCE/.**  
Treating radioactive contamination of human organism by using tritiated water  
[CEA-R-3974] N70-37111
- COMMITTEE ON INTERIOR AND INSULAR AFFAIRS /U. S. SENATE/.**  
Proposed legislation for conducting research and studies on ecological systems, natural resources, and environmental quality  
N70-36151
- CONGRESS. HOUSE. COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE.**  
Congressional hearings on air pollution control research in motor vehicle, aircraft, and diesel exhausts, and industrial and federal facilities wastes  
N70-36154
- CONGRESS. SENATE. COMMITTEE ON PUBLIC WORKS.**  
Hearing on air pollution in St. Louis area  
N70-35518



- Congressional hearings on establishing air quality criteria with respect to health and safety practices N70-35632
- Cost estimates for air pollution control during fiscal years 1970 to 1974 [S-DOC-91-40] N70-36024
- Progress in air pollution control [S-DOC-91-11] N70-36025

## D

- DEFENSE DOCUMENTATION CENTER, ALEXANDRIA, VA.  
Bibliography on small group dynamics - Vol. 1 [AD-703600] N70-35482
- DEPARTMENT OF CIVIL AVIATION, MELBOURNE /AUSTRALIA/.  
Chart and printed material legibility in cockpits for pilots [AM-MEMO-27] N70-36861
- Consequences of tinting in aircraft windshields [AM-MEMO-26] N70-37511
- DEPARTMENT OF LABOR, WASHINGTON, D. C.  
Industrial safety hazards of group and individual inorganic acids with control and preventive measures N70-36635
- Fundamentals of accident prevention N70-37216

## E

- EDGENOSSISCHE TECHNISCHE HOCHSCHULE, ZURICH /SWITZERLAND/.  
Topological characteristics effects on stereoscopic perception [DISS-4259] N70-36394
- EXOTECH, INC., WASHINGTON, D. C.  
Planetary quarantine flight regulations and information system, microbe release probability, heat sterilization cycles, organic synthesis and contamination factors, Mars landing microbes [NASA-CR-112501] N70-35042
- Subjects on planetary flight missions, supporting technology, microbial release probabilities, heat sterilization cycles N70-35043
- Estimation of microbial release probabilities from Martian lander N70-35044

## F

- FEDERAL AVIATION ADMINISTRATION, OKLAHOMA CITY, OKLA.  
High temperature effects on performance of complex tasks by senior pilots [AD-703632] N70-35090
- Task signal rate effects on human monitoring of static process [AD-703635] N70-35091
- Influences of visual angle and retinal speed on duration and intensity of illusory motion [AD-703634] N70-35354
- FEDERAL WATER POLLUTION CONTROL ADMINISTRATION, WASHINGTON, D. C.  
Biological field investigative techniques and practices of water pollution N70-36149
- FLYING PERSONNEL RESEARCH COMMITTEE, LONDON /ENGLAND/.  
Industrial safety harness assessment for aircraft serving personnel [FPRC/MEMO-246] N70-36510

## G

- GESELLSCHAFT FUER STRAHLENFORSCHUNG M.B.H., MUNICH /WEST GERMANY/.  
Frequency and origin of somatic and genetic radiation damage for external irradiation or after incorporation of radionuclides [EUR-4405-D] N70-36291

## H

- HAMILTON STANDARD, WINDSOR LOCKS, CONN.  
Personal portable oxygen respiratory support equipment [NASA-CR-112402] N70-36414

- HARRIS RESEARCH LABS., INC., ROCKVILLE, MD.  
Analysis of comfort and function factors for clothing [AD-703143] N70-36340
- HAWAII UNIV., HONOLULU.  
Hydrostatic pressure effects on photosynthesis and growth of unicellular marine algae and diatoms [AD-704496] N70-36546
- HOKKAIDO UNIV., SAPPORO /JAPAN/.  
Inflation tests of liferafts with CO2 and N2 at low temperatures N70-35262
- HULL UNIV. /ENGLAND/.  
Endogenous metabolism and survival of non-spore forming anaerobic bacteria under starving conditions [AD-703930] N70-36272
- HUMAN ENGINEERING LABS., ABERDEEN PROVING GROUND, MD.  
Bibliography on reaction time in human information processing tasks [AD-703857] N70-35375
- HUMAN FACTORS RESEARCH, INC., GOLETA, CALIF.  
Technology review on cutaneous sensitivity research [AD-704344] N70-35093
- HUMAN RESOURCES RESEARCH ORGANIZATION, ALEXANDRIA, VA.  
Criteria for rating proficient performance of complex job in aviation combat situation [AD-703510] N70-34944
- Laboratory and field studies for data acquisition on tank crews during combat operations [AD-705705] N70-36449
- Evaluation of integrated contact-instrument concept for Army fixed wing flight instruction [AD-703161] N70-36454
- Geographic orientation in air operations for military aircraft systems [AD-705021] N70-36457
- INDIANA UNIV., BLOOMINGTON.  
Literature search with abstracts on visual performance standards for selection and retention of astronauts [NASA-CR-108587] N70-36362
- INTERIOR DEPT., WASHINGTON, D. C.  
Bibliography of literature on environmental contamination by mercury N70-37333

## J

- JOHNS HOPKINS UNIV., BALTIMORE, MD.  
Heart pathology and myocardial infarction research, including data management and animal studies [PB-190112] N70-37576
- JOINT PUBLICATIONS RESEARCH SERVICE, WASHINGTON, D. C.  
Transactions on aerospace biology and medicine [JPRS-50862] N70-34986
- State-of-the-art review on habituation processes and vestibular adaptation N70-34989
- Prolonged space flight simulation and irradiation effects on dogs treated with ATP and amytraviv drugs N70-34990
- Incidence of hypoxia and hypercapnia at ambient temperature in white mice and rats in nitrogen-oxygen or helium-oxygen atmospheres N70-34992
- Carbon dioxide tension in arterial blood effects on rhythmic volley activity of respiratory neurons in medulla oblongata N70-34993
- Chlorella cultivation productivity N70-34994
- Fractional composition of skeletal muscle proteins in white rats during hypokinesia N70-34995
- Aldosterone effect on hemodynamics of dogs under restricted movement in cages N70-34996
- RNA concentration and protein synthesis in brain and memory retention under high altitude hypoxia stress

## CORPORATE SOURCE INDEX

## NATIONAL AERONAUTICS AND SPACE ADMINISTRATION.

N70-34997  
Absorption, distribution, and elimination of  
glycine by rats after exposure to hypoxia  
N70-34998  
Physiological responses of Soyuz 6, 7, and 8  
astronauts  
N70-34999  
Psychological effects of assigning unexpected  
tasks to operator in simulated space flight  
environment  
N70-35000  
Reduced atmospheric pressure effect on human  
elimination of gaseous and volatile metabolites  
in pressurized suits  
N70-35001  
Mineral and water metabolism in humans after  
exposure to transverse acceleration  
N70-35002  
Otolithic weight changes and vestibular disorders  
during weightlessness  
N70-35003  
Electrolyteless ultrasonic Doppler biotelemetry  
cardiography system  
N70-35004  
Morphological changes in bone and muscle tissue  
during hypokinesia  
N70-35005  
Physiological measurements and onboard computer  
processing for biotelemetric control of manned  
space flight  
[JPRS-50977]  
N70-35982  
Design of automated physiological measuring and  
biotelemetry system for manned spaceship  
N70-35983  
Physiological measurements and algorithms for data  
processing in biological telemetry  
N70-35984  
Physiological monitoring system for interplanetary  
manned space flight  
N70-35985  
Neuron reticulum model for visual information  
processing  
[JPRS-51142]  
N70-36036  
Aerospace medicine development in Russia  
N70-37005  
Stress effects on human nervous system and  
physiological responses  
[JPRS-51067]  
N70-37063  
Electrophysiological parameter changes after  
disturbance of motor conditioned reaction rhythm  
in man  
N70-37064  
Rheoencephalographic changes as indication of  
psychic stress  
N70-37065  
Reflection of reality as mechanism controlling  
behavior of life  
[JPRS-51176]  
N70-37279

## L

LABORATORIO DE ACUSTICA E SONICA, SAO PAULO /BRAZIL/.  
Sound level measurements in industrial plants  
[TR-6910.386]  
N70-35320  
LOCKHEED MISSILES AND SPACE CO., PALO ALTO, CALIF.  
Vestibular and optokinetic stimulation effects on  
work capacity and reliability of human control  
operator in flying vehicle  
N70-36956

## M

MELPAR, INC., FALLS CHURCH, VA.  
Adaptive mathematical model development for  
deriving automated pilot performance measurement  
techniques  
[AD-704597]  
N70-36244  
METROPOLITAN REGIONAL COUNCIL, INC., NEW YORK.  
Air quality control standards for New Jersey, New  
York, and Connecticut  
[PB-191389]  
N70-37519  
MICHIGAN UNIV., ANN ARBOR.  
Applications of decision making, probability  
theory, and multi-level inference systems to  
aerospace information processing  
[NASA-CR-112842]  
N70-37468  
MICROBIOLOGICAL ASSOCIATES, INC., BETHESDA, MD.  
Murine viruses in germfree mice selected for  
extraterrestrial life testing of Apollo lunar

samples  
[NASA-CR-108589]  
N70-36473  
MISSISSIPPI UNIV., UNIVERSITY.  
Automatic control systems using small animals  
[AD-703085]  
N70-35636  
MOUNT SINAI HOSPITAL, NEW YORK.  
Hepatic subcellular effects of altered atmospheres  
[AD-705220]  
N70-36211

## N

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION.  
ELECTRONICS RESEARCH CENTER, CAMBRIDGE, MASS.  
Repair of dental enamel using calcium phosphate  
gel  
[NASA-CASE-ERC-10338]  
N70-36053  
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION.  
LANGLEY RESEARCH CENTER, LANGLEY STATION, VA.  
Pressurized liquid waste feed system for water  
reclamation in weightless environment  
[NASA-CASE-LAR-10365-1]  
N70-35619  
Effect of cabin pressure on environmental control  
system  
[NASA-TM-X-65009]  
N70-35804  
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. MANNED  
SPACECRAFT CENTER, HOUSTON, TEX.  
Design of inflatable life raft for aircrafts and  
boats  
[NASA-CASE-XMS-00863]  
N70-34857  
Shock absorbing couch for body support under high  
acceleration or deceleration forces  
[NASA-CASE-XMS-01240]  
N70-35152  
Development of nylon-linen webbing material for  
restraint harness in Apollo spacecraft  
[NASA-TM-X-64437]  
N70-35661  
Test program for determining visual reference  
requirements for pilot control of gliding  
parachutes used in landing spacecraft on land  
[NASA-TM-X-64430]  
N70-35696  
Performance of Apollo sea dye marking powder  
[NASA-TM-X-65045]  
N70-35724  
Breathing mask for Apollo command module spacecrew  
[NASA-TM-X-64441]  
N70-35728  
Feasibility of steam turbine for LEM environmental  
control system  
[NASA-TM-X-65008]  
N70-35733  
Water immersion for weightlessness simulation in  
astronaut training  
[NASA-TM-X-64428]  
N70-35749  
Crew training program for third manned Apollo  
mission  
[NASA-TM-X-65047]  
N70-35788  
Mission training program for Apollo Lunar Landing  
Mission  
[NASA-TM-X-65078]  
N70-35826  
Crew training program for lunar module thermal  
vacuum testing  
[NASA-TM-X-65082]  
N70-35857  
Lightweight life preserver without fastening  
devices  
[NASA-CASE-XMS-00864]  
N70-36493  
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. MANNED  
SPACECRAFT CENTER, LANGLEY STATION, VA.  
Water management during flight of Apollo  
spacecraft  
[NASA-TM-X-64445]  
N70-35803  
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION.  
MARSHALL SPACE FLIGHT CENTER, HUNTSVILLE, ALA.  
Simulation test data for storage box transfer  
through airlock module  
[NASA-TM-X-53887]  
N70-35915  
Stress effects of high noise levels on lower body  
negative pressure experiments  
[NASA-TM-D-5967]  
N70-37076  
Philosophy and technology of unmanned spacecraft  
sterilization and planetary quarantine  
[NASA-TM-X-53884]  
N70-37461  
Cleaning procedure effects on sterilization of  
spacecraft components  
[NASA-TM-X-53885]  
N70-37500  
Simulation test report for multiple docking  
adapter external handrail system evaluation  
[NASA-TM-X-53894]  
N70-37533  
Methods and procedures for evaluating internal  
mobility aids in multiple docking adapters  
[NASA-TM-X-53895]  
N70-37583  
Alcohol sporulation evaluation for contamination  
control in stainless steels  
[NASA-TM-X-53891]  
N70-37585

NATIONAL CANCER INST., BETHESDA, MD.

CORPORATE SOURCE INDEX

NATIONAL CANCER INST., BETHESDA, MD.  
Proceedings from symposium on inhalation  
carcinogenesis  
[CONF-691001] N70-37428

NAVAL AEROSPACE MEDICAL INST., PENSACOLA, FLA.  
Anthropometric determinations of American born  
Macaca mulatta for orbiting primate experiment  
[AD-700907] N70-36495

NAVAL AIR DEVELOPMENT CENTER, JOHNSVILLE, PA.  
Renal hemodynamic response of unanesthetized dogs  
to negative acceleration  
[AD-702745] N70-36301

Portable dry ice, water conditioned suit system  
[AD-700915] N70-36364

NAVAL MEDICAL RESEARCH INST., BETHESDA, MD.  
Nonlinear regression analysis of biomedical data  
by time-sharing computers  
[AD-704858] N70-36541

Personality correlates of centering of self in  
phenomenal field  
[AD-705065] N70-36551

Data acquisition for confined groups of humans  
[AD-705066] N70-36574

Human electric shock hazards - bibliographies  
[AD-705067] N70-36575

NAVAL POSTGRADUATE SCHOOL, MONTEREY, CALIF.  
Physiological correlates of vigilance performance  
in humans  
[AD-706054] N70-34976

NEW YORK UNIV., N. Y.  
Evoked potentials and visual information  
processing  
[AD-703330] N70-35504

O

OAK RIDGE NATIONAL LAB., TENN.  
Genetic effects of radiation dosage on Neurospora  
during Gemini 11 and biosatellite 2 missions  
[NASA-CR-112354] N70-36826

Proceedings from symposium on inhalation  
carcinogenesis  
[CONF-691001] N70-37428

OXFORD UNIV., /ENGLAND/.  
Rejection of arm prosthetic devices by children  
with congenital deformities  
[PR-1103-70] N70-37224

P

PILLSBURY MILLS, INC., MINNEAPOLIS, MINN.  
Improved acceptability of feeding system of  
reversibly compressed, dehydrated food bars and  
cubes of sauces and seasonings  
[NASA-CR-112676] N70-36775

PITTSBURGH UNIV., PA.  
Heat stress effects on cellular structure and  
function  
[AD-705654] N70-36418

PRESIDENT'S SCIENCE ADVISORY COMMITTEE, WASHINGTON,  
D. C.  
Biomedical foundations of manned space flight  
[AD-703316] N70-35340

PUBLIC HEALTH SERVICE, LAS VEGAS, NEV.  
Physical and chemical characteristics and possible  
hazards from particulate matter released from  
Phoebus 1B - EP 4 reactor  
[SWRHL-46-R] N70-37340

R

RAND CORP., SANTA MONICA, CALIF.  
Linguistic competence of languages and performance  
grammars in machine conversation  
[P-4391] N70-36107

S

SACRAMENTO REGIONAL AREA PLANNING COMMISSION, CALIF.  
Air pollution threat in Sacramento, California,  
projected population, vehicles, and activities  
[PB-191382] N70-37433

SANDIA CORP., ALBUQUERQUE, N. MEX.  
Effectiveness of thermoradiation sterilization of  
spacecraft hardware  
[NASA-CR-109972] N70-35167

Research and developments in planetary quarantine  
program  
[NASA-CR-110046] N70-35931

SCHOOL OF AEROSPACE MEDICINE, BROOKS AFB, TEX.  
Adjustable headholder for semicircular canal  
caloric testing  
[AD-700738] N70-36435

External measurement of Fe-59 ferrokinetics  
[AD-705046] N70-36467

Nitrogen trifluoride effects on rat cardiovascular  
system  
[AD-705045] N70-36468

SCIENTIFIC TRANSLATION SERVICE, SANTA BARBARA, CALIF.  
Enzymatic activity in model with lipid membrane  
separating ribonuclease enzyme from RNA  
substrate  
[NASA-TT-F-13185] N70-37471

Applying paleontological method of studying  
sedimentary deposits to investigation of  
earliest forms of life in northern Eurasia  
[NASA-TT-F-13189] N70-37473

Evolution trends of carbohydrate metabolism in  
invertebrates  
[NASA-TT-F-13190] N70-37490

Abiogenesis and effect of ultraviolet radiation on  
one-celled organisms  
[NASA-TT-F-13188] N70-37502

Protein biosynthesis of various forms of soluble  
ribonucleic acids and aminoacyl RNA synthetases  
[NASA-TT-F-13186] N70-37531

Enzyme system of respiratory chain and oxidizing  
phosphorylation in bacteria  
[NASA-TT-F-13187] N70-37564

SHEPPARD UNIV., /ENGLAND/.  
Case history of search profiles and selective  
dissemination of information on intestine  
material absorption  
[OSTI-5027] N70-37047

SPERRY RAND CORP., GREAT NECK, N. Y.  
Research in visual perception for carrier landing  
[AD-706036] N70-36480

STANFORD UNIV., CALIF.  
Nonlinear analysis of pressure waves and shock  
waves in blood vessels  
[NASA-CR-112864] N70-36857

Variations in mechanical properties of canine  
abdominal vena cava  
[NASA-CR-112876] N70-37029

Cytochemical studies of planetary microorganisms  
and explorations in exobiology  
[NASA-CR-112847] N70-37403

SYRACUSE UNIV., N. Y.  
Temporal sensory integration and auditory and  
tactile thresholds  
[AD-703376] N70-35366

SYSTEM DEVELOPMENT CORP., SANTA MONICA, CALIF.  
Complementary capabilities of man and machine for  
planning and creative problem solving  
[AD-704810] N70-34841

T

TECHTRAN CORP., GLEN BURNIE, MD.  
Effect of 3-methylisoxazole-5-carbonic acid on  
metabolism and thermoregulation of mice exposed  
to cold  
[NASA-TT-F-13158] N70-36110

TELLURON, SANTA MONICA, CALIF.  
Adaptive controller machine based on application  
of generalized punishments or rewards  
[AD-703758] N70-35311

TEXAS CHRISTIAN UNIV., FORT WORTH.  
Space simulator to produce visual properties of  
objects outside earth atmosphere and determine  
distance and rate perception  
[NASA-CR-112843] N70-37467

TRANSLATION CONSULTANTS, LTD., ARLINGTON, VA.  
Chemical reduction capacity of various microflora  
found in silt and soil deposits from different  
biochemical regions  
[NASA-TT-F-13197] N70-36013

Evolution of cholinergic mediatory process in  
mollusks  
[NASA-TT-F-13192] N70-36132

Geochemical ecology of plants  
[NASA-TT-F-13198] N70-36133

Role of mediators in individual development and  
changes in their functions during evolution  
[NASA-TT-F-13191] N70-37559

TBW, INC., CLEVELAND, OHIO.  
Manned testing of flight breadboard oxygen system  
[NASA-CR-73395] N70-36933

## W

- WAKE FOREST COLL., WINSTON-SALEM, N. C.  
Cerebral and symmetric vascular dynamics in  
response to stress  
[AD-701941] N70-36397
- WEIZMANN INST. OF SCIENCE, REHOVOTH /ISRAEL/.  
Physical characteristics of synthetic and nerve  
membranes  
[AD-698816] N70-36431
- WEST VIRGINIA UNIV., MORGANTOWN.  
Changing gravity and weightlessness effects on  
vasopressin control systems, with immunochemical  
and biological assay studies  
[NASA-CR-112358] N70-36764
- WISCONSIN UNIV., MADISON.  
Rhythmic rotational movements in unifoliate leaves  
of Phaseolus angularis Wight grown under  
continuous light conditions  
[NASA-CR-112848] N70-37398
- WOODS HOLE OCEANOGRAPHIC INSTITUTION, MASS.  
Benthic biomass and animal densities under varying  
ecological conditions  
[NYO-3862-24] N70-35107

# PUBLIC COLLECTIONS OF NASA DOCUMENTS

## DOMESTIC

NASA deposits its technical documents and bibliographic tools in eleven Federal Regional Technical Report Centers located in the organizations listed below. Each center is prepared to furnish the public such services as reference assistance, interlibrary loans, photocopy service, and assistance in obtaining copies of NASA documents for retention.

### CALIFORNIA

University of California, Berkeley

### COLORADO

University of Colorado, Boulder

### DISTRICT OF COLUMBIA

Library of Congress

### GEORGIA

Georgia Institute of Technology, Atlanta

### ILLINOIS

The John Crerar Library, Chicago

### MASSACHUSETTS

Massachusetts Institute of Technology, Cambridge

### MISSOURI

Linda Hall Library, Kansas City

### NEW YORK

Columbia University, New York

### PENNSYLVANIA

Carnegie Library of Pittsburgh

### TEXAS

Southern Methodist University, Dallas

### WASHINGTON

University of Washington, Seattle

NASA publications (those indicated by an "\*" following the accession number) are also received by the following public and free libraries:

### CALIFORNIA

Los Angeles Public Library

San Diego Public Library

### COLORADO

Denver Public Library

### CONNECTICUT

Hartford Public Library

### DELAWARE

Wilmington Institute Free Library, Wilmington

### MARYLAND

Enoch Pratt Free Library, Baltimore

### MASSACHUSETTS

Boston Public Library

### MICHIGAN

Detroit Public Library

### MINNESOTA

Minneapolis Public Library

James Jerome Hill Reference Library, St. Paul

### MISSOURI

Kansas City Public Library

St. Louis Public Library

### NEW JERSEY

Trenton Public Library

### NEW YORK

Brooklyn Public Library

Buffalo and Erie County Public Library

Rochester Public Library

New York Public Library

### OHIO

Akron Public Library

Cincinnati Public Library

Cleveland Public Library

Dayton Public Library

Toledo Public Library

### OKLAHOMA

Oklahoma County Libraries, Oklahoma City

### TENNESSEE

Cossitt-Goodwin Libraries, Memphis

### TEXAS

Dallas Public Library

Fort Worth Public Library

### WASHINGTON

Seattle Public Library

### WISCONSIN

Milwaukee Public Library

An extensive collection of NASA and NASA-sponsored documents and aerospace publications available to the public for reference purposes is maintained by the American Institute of Aeronautics and Astronautics, Technical Information Service, 750 Third Avenue, New York, New York, 10017.

## EUROPEAN

An extensive collection of NASA and NASA-sponsored publications is maintained by the National Lending Library for Science and Technology, Boston Spa, Yorkshire, England. By virtue of arrangements other than with NASA, the National Lending Library also has available many of the non-NASA publications cited in *STAR*. European requesters may purchase facsimile copy or microfiche of NASA and NASA-sponsored documents, those identified by both the symbols "\*" and "#", from: ESRO/ELDO Space Documentation Service, European Space Research Organization, 114, av de Neuilly, 92-Neuilly-sur-Seine, France.



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
WASHINGTON, D. C. 20546  
OFFICIAL BUSINESS

FIRST CLASS MAIL



POSTAGE AND FEES PAID  
NATIONAL AERONAUTICS AND  
SPACE ADMINISTRATION

POSTMASTER: If Undeliverable (Section 158  
Postal Manual) Do Not Return

*"The aeronautical and space activities of the United States shall be conducted so as to contribute . . . to the expansion of human knowledge of phenomena in the atmosphere and space. The Administration shall provide for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof."*

— NATIONAL AERONAUTICS AND SPACE ACT OF 1958

## NASA SCIENTIFIC AND TECHNICAL PUBLICATIONS

**TECHNICAL REPORTS:** Scientific and technical information considered important, complete, and a lasting contribution to existing knowledge.

**TECHNICAL NOTES:** Information less broad in scope but nevertheless of importance as a contribution to existing knowledge.

**TECHNICAL MEMORANDUMS:** Information receiving limited distribution because of preliminary data, security classification, or other reasons.

**CONTRACTOR REPORTS:** Scientific and technical information generated under a NASA contract or grant and considered an important contribution to existing knowledge.

**TECHNICAL TRANSLATIONS:** Information published in a foreign language considered to merit NASA distribution in English.

**SPECIAL PUBLICATIONS:** Information derived from or of value to NASA activities. Publications include conference proceedings, monographs, data compilations, handbooks, sourcebooks, and special bibliographies.

**TECHNOLOGY UTILIZATION PUBLICATIONS:** Information on technology used by NASA that may be of particular interest in commercial and other non-aerospace applications. Publications include Tech Briefs, Technology Utilization Reports and Notes, and Technology Surveys.

*Details on the availability of these publications may be obtained from:*

SCIENTIFIC AND TECHNICAL INFORMATION DIVISION  
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
Washington, D.C. 20546